

REPORT  
OF THE  
MUNICIPAL COMMISSIONER  
ON  
THE PLAGUE IN BOMBAY  
FOR THE YEAR ENDING 31st MAY 1899.

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*Part I.—General Administration.*

*Part II.—Hospitals (Public & Private.)*

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Bombay:  
PRINTED AT THE "TIMES OF INDIA" STEAM PRESS

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BOMBAY MUNICIPAL COMMISSIONER'S REPORT

# REPORT

OF THE

MUNICIPAL COMMISSIONER

ON

## THE PLAGUE IN BOMBAY

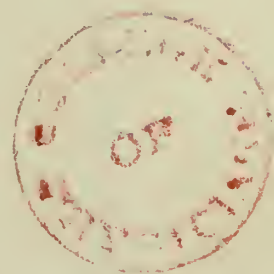
FOR THE YEAR ENDING 31<sup>ST</sup> MAY 1899.

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PART I.

GENERAL ADMINISTRATION.

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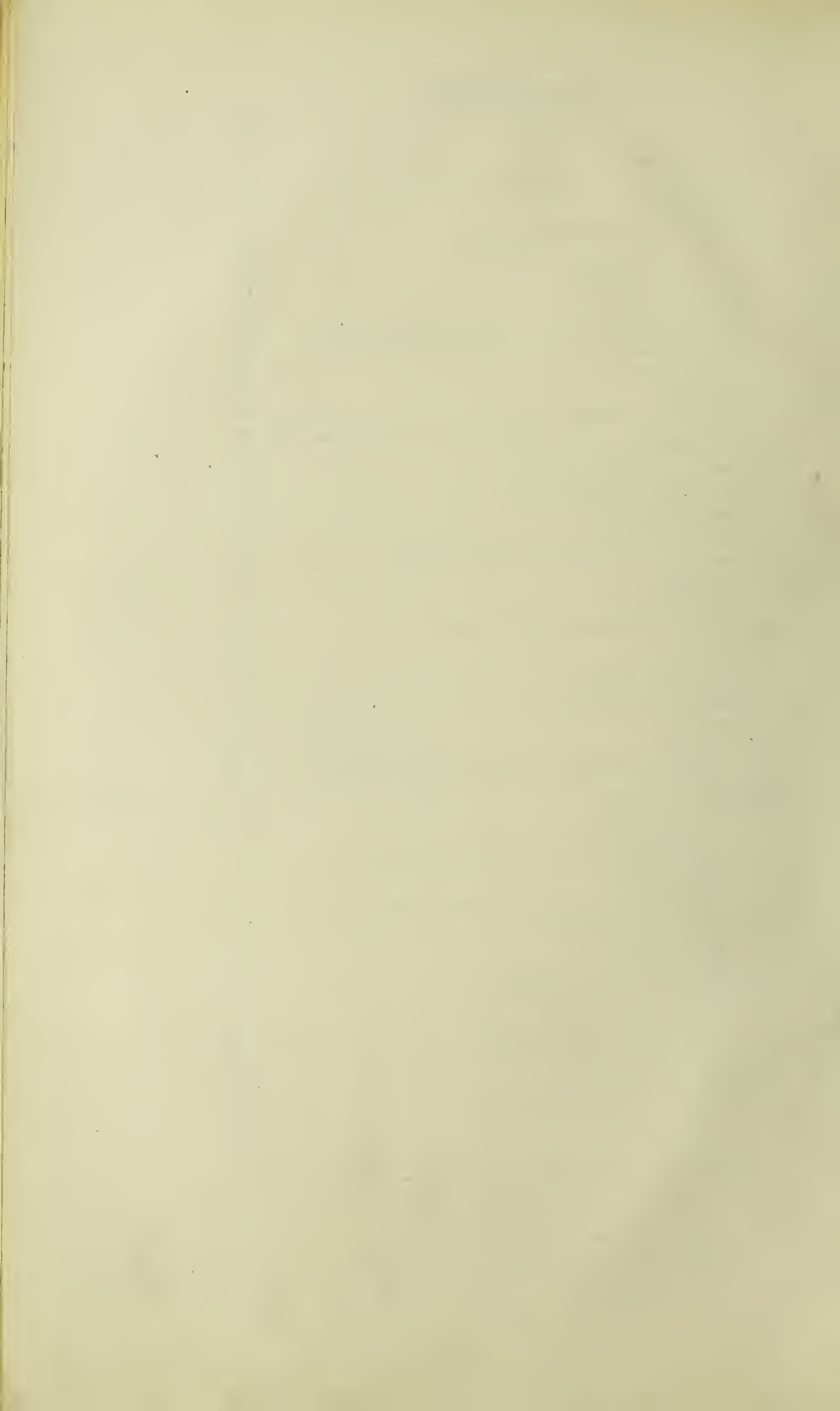
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MUNICIPAL OFFICES,  
BOMBAY, 19th October 1899.

FROM

W. L. HARVEY, Esq., I. C. S.,  
Municipal Commissioner for the City of Bombay ;

TO

THE PLAGUE COMMISSIONER  
AND  
CHIEF SECRETARY TO GOVERNMENT.

SIR,

I have the honour to forward herewith Part I. of the Report on Plague Operations in Bombay during the year ending 31st May 1899. This portion of the report deals with general plague measures in the City, and has been written by Mr. J. H. DuBoulay, I. C. S., Deputy Commissioner in charge, Plague Operations. The second portion of the report relates to Hospitals, and will be forwarded in a few days.

2. The assistance rendered by a number of gentlemen has been recognized in the report, and I heartily endorse the remarks therein contained. I have only now to bring to the notice of Government the services of those officers who have not already been mentioned. Since the 12th August 1898 all plague measures in the City, with the exception of the control of Hospitals, have been under the direction of Mr. DuBoulay whose previous experience as Deputy Municipal Commissioner and success as a District Plague Officer had marked him out as specially fitted for the difficult post he now holds. He has throughout carried on the duties of that office with the most indefatigable zeal and devotion, and his tact and resource have frequently succeeded in overcoming difficulties which seemed almost insuperable. The numerous improvements which he has been able to effect in the existing system of work—and I would specially mention the difficult problem of death registration—illustrates the thoroughness of his supervision and his admirable powers of organization and the fact that while strictly enforcing the orders of Government he has won the confidence of the volunteers, and leaders of all Communities, bear eloquent testimony to the sympathetic consideration towards the people which has always been a marked feature of his administrative work.

3. In Colonel Wilkins, D.S.O., Special Medical Officer, the City has had the benefit of the services of an officer of great ability and experience. His management of Municipal Hospitals and Camps left nothing to be desired, and his advice and guidance were much appreciated by the managers of similar private institutions. Government have already recognized Colonel Wilkins' services during the last epidemic in Government Resolution No. 3267-P., dated 15th May 1899, and it is a matter of congratulation that he has again been posted to Bombay in the same capacity as before.

4. I would specially commend to the notice of Government the excellent service done by the officers in charge of Districts. The burden of carrying out the measures now in force rests on them, and on their energy, tact, and sympathy depends the measure of success to be achieved. Their duties during the continuance of the epidemic have been most loyally performed, and while some officers have shown greater aptitude than others all have endeavoured by patience and an unsparing devotion to work which is always monotonous and frequently difficult and irksome to attain the end in view. It is impossible to over-estimate the value of their services, and the fact that complaints have been of comparatively rare occurrence demonstrates the thoroughness of their control over the large establishments subordinate to them. Some of our most experienced officers have been

Lt. Keogh—G. R. No. 87-P of 6th January 1899.  
 Lt. Strong—G. R. No. 1562-P of 1st March 1899.  
 Lt. Firth—G. R. No. 3087-P of 6th May 1899.  
 Lt. Warneford—G. R. No. 4103-P of 26th June 1899.  
 Sirdar Mahomed Yakub—G. R. No. 2611-P of 14th April 1899.  
 Capt. Lewis—G. R. No. 5695-P of 18th September 1899.

claimed for other duties and Government have already recorded their appreciation of their merits in the Government Resolutions quoted in the margin: of the others who

have served for considerable portion of the year, I would particularly mention Lieutenants French and Brackenbury as having well deserved the confidence placed in them.

Dr. Shroff—Acting Divisional Health Officer.	}	Deputy Health Officers.
Dr. Malegamwalla.		
Dr. Britto.		
Dr. Dady Barjore.	}	Sectional Medical Officers.
Dr. Jayaker.		
Dr. Fazal Ahmed.		
Dr. Kapadia.		
Dr. Abadan.		
Dr. R. V. Patel.		
Dr. Contractor.		
Dr. Bardi.	}	Of the Bombay Customs Department.
Dr. Munshi.		
Mr. C. J. Clark		
Khan Saheb Sayed Nisar Huscin.		

5. I have had every reason to be satisfied with the staff working under the District Officers. Their work is of a trying nature and for its proper performance demands a high standard and carefulness, self-restraint, and devotion. The officers marginally noted deserve especial mention.

6. The Health Department has been relieved of much of the duty it formerly had to perform in connection with Plague, but Colonel Weir's advice and assistance have always been freely and readily given—and he and the Divisional Health Officers deserve the greatest credit for the efficient state in which they maintained their establishments during the severe and trying circumstances of the epidemic.



7. I have received at all times the greatest aid from Mr. R. H. Vincent, C.I.E., and Mr. Kennedy, Commissioners of Police, and from Mr. H. G. Gell, Deputy Commissioner of Police. It was fortunately unnecessary to use coercion to any great extent, but the knowledge that we could rely on the hearty co-operation of the Police authorities enabled us to work with a confidence that would otherwise have been absent.

8. The attitude of the Corporation placed, as it was, in a somewhat difficult position, has been of a friendly character, and the discussions that have taken place on various points connected with Plague Administration have never been calculated to hamper or embarrass. Many of the individual members have worked with the greatest energy in their districts and many have assisted in other directions. I have already had the pleasure of bringing their names to the notice of Government.

I have the honour to be,  
Sir,  
Your most obedient Servant,

W. L. HARVEY,  
Municipal Commissioner  
for the City of Bombay.



## CHAPTER I.

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### GENERAL.

#### Introduction.

SINCE plague first became established in Bombay, there have only been 8 days on which the Official Returns showed no attacks or deaths. Of these 7 occurred in the month of July 1897, and 1 in August of the same year. It is not therefore necessary, in dealing with the past epidemic, to search for its origin outside the limits of Bombay.

How the disease spreads from man to man, why at certain seasons, in spite of all that can be done, it assumes epidemic proportions, and why, again, at other seasons, with precisely the same measures in force it relapses into comparative inactivity, are subjects about which we are little wiser now than we were at the end of the first epidemic.

It might be urged that, with a numerous staff so long and persistently engaged on plague duty, there should be a mass of material available for the elucidation of such questions; but the conditions of plague administration offer few facilities for scientific observation, and it is an experience common to most of those who have come in contact with plague, that their knowledge seems to contract as their experience widens. The scientific problems connected with the disease will, no doubt, be fully dealt with in the report of the Indian Plague Commission. This report will be confined to the facts of the last epidemic, its progress, and the measures taken to deal with it, with a few remarks on the results of those measures, so far as can be gathered from the limited and unreliable data available.

#### Administration.

Government, in their Resolution No. 3018--3397-P of 27th May 1898, transferred the responsibility of plague administration in Bombay from the Plague Committee to the Municipal Commissioner, under the direct control of the Plague Commissioner. They further provided for the appointment of a Special Deputy Commissioner and a Special Medical Officer.

The month of May was occupied in winding up the affairs of the Plague Committee, and Mr. A. Cumine, I.C.S., who had relieved Sir J. Campbell, K.C.I.E., I.C.S., as Chairman of the Committee, actually handed over charge of plague operations to the Municipal Commissioner, Mr. P. C. H. Snow, I.C.S., on the 7th June 1898; Mr. W. L. Harvey, I.C.S., relieved Mr. Snow on the 20th August.

Government more fully defined the powers and duties of the Municipal Commissioner and his assistants in regard to Plague in their Notification No. 4516—4779-P of the 12th August 1898, and at the same time appointed Mr. J. H. DuBoulay, I.C.S., to be Deputy Commissioner for plague operations, and Lieut.-Col. J. S. Wilkins, D.S.O., I.M.S., to be Special Medical Officer for plague operations. Mr. DuBoulay took charge of his duties on the same day, and remained in charge till the end of the year; Lieut.-Col. Wilkins was placed at the disposal of the Bombay Government for plague duty on the 7th October and remained in charge till he went on privilege leave in the first week of May 1899, when Dr. C. H. Cayley, Divisional Health Officer of Bombay, took over his duties.

It was intended that the city should be split up into districts of a manageable size, each under the control of a Staff Corps Officer, assisted by a European Medical Officer; but the only doctors sent out by the Secretary of State, who had any plague duty in Bombay during the year, were Dr. Thomas, who was in charge of the Maratha Hospital till he was transferred to the Madras Presidency at the beginning of September; Dr. C. T. Parsons, who was on special duty at the Arthur Road Hospital from 16th June till he was transferred to Hubli at the end of August; Dr. Haydon, who was in charge of D Ward till relieved by Captain Lock on 13th June 1898; Dr. R. D. Dalal who was in charge of E Ward, West, till relieved by Lt. French on 15th June; and Dr. G. W. Lewis, who was connected with the Central District from 11th November 1898 till 26th May 1899.

In short, Dr. Lewis alone was in Bombay during the Epidemic of 1898-99. A large number of Military Officers were, however, on plague duty at various times during the year. The following note shows where they served:—

*A Ward : Comprising Colaba (Upper, Middle and Lower), Fort (North and South), and the Esplanade.*—Lieut. Strong, I.S.C., was in charge until he went home on sick leave. He was assisted by Capt. Lock from 9th February, and relieved by him on 6th March, that Officer having a second time been placed on plague duty shortly after his return from leave.

*B Ward, South : Comprising Mandvi and Chakla.*—Lieut. Brackenbury, I.S.C., was in charge throughout the year.

*B Ward, North : Comprising Umarkhari and Dongri.*—This subsection of B Ward was placed in charge of Mr. H. M. Judge, Assistant



Collector, Salt Revenue, who was placed at the disposal of the Plague Commissioner by G. R. 3500—3874-P. of 18th June 1898. He was relieved on 1st September by Capt. Jenkin Jones, I.S.C. Lieut. Keogh, R.A., was transferred from C Ward to assist Capt. Jones on 23rd September, and relieved that officer on his departure on 28th November. This district was formally constituted a separate charge on 2nd October 1898. Lieut. Nangle, I.S.C., relieved Lieut. Keogh on 13th December, the latter Officer being transferred to F and G Wards. Capt. Pritchard, I.S.C., took the place of Lieut. Nangle on the 13th March, and remained in charge till the end of the year.

*C Ward : Comprising Market, Dhobitalao, Bhuleshwar, Fanaswadi, Kumbharwada and (till the constitution of the Central District) Khara-talao.*—The commencement of the year found Capt. Bingley, I.S.C., in charge of C Ward, with Lieut. Warneford, I.S.C. Capt. Bingley reverted to Military employment by G. R. 4559—4801-P. of 15th August 1898, and Lieut. Warneford took charge of the whole district. He was assisted by Lieut. Keogh, who joined at the end of July, till his transfer to B Ward on 23rd September 1898. He was assisted by Lieut. Anderson, I.S.C., from 6th September till that officer reverted at the end of February. He was assisted by Lieut. Hopwood, I.S.C., from 27th December 1898 to 22nd April 1899. Mr. C. J. Clark, of the Bombay Customs Department, was placed at Lieut. Warneford's disposal at the end of January as Superintendent of Disinfection, and continued there till the end of May, when he was transferred to the Central District.

*D Ward : Comprising Khetwadi, Girgaum, Chowpatti, Walkeshwar and Mahalaxmi.*—Capt. Lock, I.S.C., previously engaged in the Pass Department at the Town Hall, took charge of D Ward from Dr. Haydon on 13th June 1898.

Capt. Lock reverted to the Government of India on 15th October and went home on account of ill-health ; the district remaining in charge of Dr. Shroff till the end of December, when Lieut. Tristram was placed at the disposal of the Municipal Commissioner and relieved him. Capt. Wood, I.S.C., reported himself on 11th January 1899, and took charge of the district ; Lieut. Tristram, I.S.C., being transferred to F and G Wards. Capt. Wood reverted to military employ on 28th February, and was replaced by Capt. Cuppage, I.S.C., who reported himself on 6th March. Capt. Dunbar Stuart, I.S.C., reported himself on 15th March, and was posted to the district as Joint District Officer. He took sole charge of the district on 8th May 1899, when Capt. Cuppage was transferred to C Ward, and remained in charge till the end of the year.

*E Ward, West : Comprising Kamatipura, Tardeo, 1st Nagpada, and (till the constitution of the Central District), 2nd Nagpada.*—The commencement of the year found Dr. R. D. Dalal in charge. Lieut. French,

I. S. C., joined from Thana and relieved him on 15th June and remained in charge throughout the year.

*E Ward, East, Byculla : Comprising Byculla only.*—Mr. Stewart, I.C.S., was in charge of the whole district of E Ward, East, at the beginning of the year. Lieut. Firth, I.S.C., came to Bombay and took charge, on 8th June, though Mr. Stewart continued to exercise general supervision till 12th August. Lieut. Firth remained in charge of Byculla till 5th May 1899, when he was relieved by Capt. Wooldridge, I.S.C.

*E Ward, East, Wari Bandar : Comprising Mazagaum and Tarwari.*—Lieut. Light, I.S.C., reported himself on 24th December 1898, and was posted to this district which was constituted a separate charge from that time. He reverted to military employ on 19th May 1899, and was replaced on 23rd May 1899 by Capt. Walling, I.S.C., who remained in charge till the end of the year. Lieut. Haworth, I.S.C., reported himself on 23rd March 1899, and assisted in this district till the end of the year.

Mr. George Lund, who gave his services voluntarily, was in practically independent charge of Tarwari throughout the year.

*F and G Wards : Comprising Parel, Sevri, Sion, Mahim and Worli.*—Capt. Lewis was in charge throughout the year. He was assisted by—

Lieut. Keogh, R.A., from 14th December 1898 to 18th January 1899.

Lieut. Griffith, I.S.C., from 27th December 1898 to 16th May 1899.

Lieut. Tristram, I.S.C., from 11th January 1899 to 22nd May 1899.

Capt. Wooldridge, I.S.C., from 28th March 1899 to 4th May 1899.

Lieut. Stewart, I.S.C., from 20th May 1899 to the end of the year.

Lieut. Palæologus, I.S.C., from 19th May 1899 to the end of the year.

CENTRAL DISTRICT.—*This District, comprising portions of Chakla, Umarkhari, Bhuleshwar, Byculla and the whole of Kharatalao and 2nd Nagpada*, was constituted on 1st November and was placed in charge of Sirdar Mahommed Yakub, Deputy Commissioner, who reported himself on 7th October 1898 and was on general duty till he took charge. He was assisted by Khan Bahadur Fazlullah Latfullah of the Bombay Customs Department from 25th October 1898 to 24th January 1899. Dr. Lewis came from Karachi and joined him on 11th November 1898, and took sole charge on 15th April 1899 when the Sirdar went on leave. Lieut. Warneford took temporary charge on 26th May on Dr. Lewis's transfer to Karachi. Lieut. Warneford took Mr. C. J. Clark with him from C Ward. Khan Saheb Syed Nissar Hussein of the Bombay Collector's Office was placed on duty in this district from 1st February to the end of the year.

The above shows the administrative sub-divisions of Bombay. They corresponded generally with the Ward Divisions ; but F and G Wards were treated as one, B Ward was divided into two,—B Ward,



North comprising Umarkhari and Dongri ; and B Ward, South, comprising Mandvi and Chukla. E. Ward was divided into three—E Ward, West, comprising Kamatipura, 1st Nagpada and Tardeo; E Ward, East, Byculla, consisting of that section only ; and E Ward East, Wari Bandar, including Mazagaum and Tarwari.

The success attained by Sirdar Mahomed Yakub in dealing with the Karachi Mussulmans during the plague led to his transfer to Bombay and the constitution of the Central District. The sections included, and their boundaries are given below :—

*B Ward, Chukla—*

The area bounded on the North by the Pydhoni Road ; on the South by Nakhuda Street, Naran Dharu Street, Musjid Bandar Road ; on the East by Don Tar Street ; on the West by Abdur Rehman Street.

*Umerkhady.—*

The area bounded on the North by the Babula Tank Road ; on the South by Pydhoni Road ; on the East by Don Tar Street, Tandel Street\*, Foola Tandel Row\*, Bengalpura Row\*, Umerkhadi Row\*, and Jail Road, West ; on the West by Parel Road.

\* Both sides.

*C Ward.—The whole of Khara Talao.—*

*Bhuleshwar.—*

The area bounded on the North by Erskine Road ; on the South by Pydhoni Road ; on the East by Parel Road ; on the West by Bapu Khote Street (both sides).

*E Ward.—The whole of 2nd Nagpada.*

*Byculla.—*

The area bounded on the North by Kalapani Mosque ; on the South by Bellasis Road ; on the East by Ripon Road (both sides including Kalapani, Agripada and Madanpura Street) ; on the West by Morland Road.

The population was estimated at about  $1\frac{1}{4}$  lakhs, including  $\frac{1}{4}$  lakh of Hindus, with a few Christians, Parsees, &c., and 100,000 Mussalmans, or about 80 per cent. of the entire Mahomedan population of Bombay.

The Pass Office which had been opened in March 1898, in the Town Hall, was closed on 13th June 1898, and thereafter passes were issued by the various District Officers till they were entirely abolished by Government Resolution No. 5772—5864-P of 16th October 1898.

The inspection of the areas in the occupation of the Military in Colaba, the Fort, Marine Lines, and Bori Bandar Lines—all portions of A Ward—and the detection and removal of plague cases there were, as in the previous year, entrusted to the Military ; and most efficiently carried out.

All measures in connection with the Health Department scavengers and sweepers were left entirely in the control of that department.

**Outline of measures adopted.**

The following report from the Municipal Commissioner to the Corporation gives in outline the measures adopted to combat the plague :—

No. 18550 of 1898-99.

BOMBAY, 18th October 1898.

FROM W. L. HARVEY, Esq., I.C.S.,

Acting Municipal Commissioner for the City of Bombay.

TO THE MUNICIPAL SECRETARY.

SIR,—With reference to Corporation Resolution No. 3284 of the 7th July 1898, asking me to report on the measures it is proposed to take with the view of dealing with any recrudescence of plague in the City, I have the honour to state, for the information of the Corporation, that the operations at present in progress are based on the general lines of policy initiated by Government in March 1898, and detailed at pages 186 *et seq.* of the report of Bombay Plague Committee for 1897-98, copies of which have been supplied to the Corporation. A copy of detailed instructions to District Officers, issued in July, is also forwarded herewith. Considerable latitude in the direction of relaxation of rules is allowed to District Officers according to the varying circumstances of different localities.

2. In addition to the more general measures, *viz.*, removal of the sick to hospitals, observation of contacts and evacuation and disinfection of affected houses, particular attention is being paid to the following subjects :—

- (a) Inoculation is being encouraged.
- (b) Rats are being destroyed.
- (c) Arrangements have been made for the local preparation of Lustig's serum.
- (d) The different communities are being moved and assisted to start health camps and hospitals of their own.
- (e) Arrangements have been made for tile-turning.
- (f) A systematic survey of houses in the City is being made with a view to their sanitary improvement.

The regulations regarding the segregation of contacts have been materially relaxed, and they are permitted to attend to their ordinary duties on the sole condition of returning to camp in the evening.

3. Orders have been issued by Government regarding the abolition of passes and detention camps for travellers by railway. There will be free communication between the City of Bombay and the Island of Salsette, and inspections at the Causeways have been discontinued.

4. In conclusion, I have the honour to observe that all the measures at present in force depend on the assistance and co-operation of the Volunteer Committees in the different Wards. The main object to be attained is the discovery of plague cases, and up to the present the working of the Committees has, except in a few instances, been attended with very satisfactory results. The answer to the question as to whether the present system will continue rests with the Committees themselves. They have accepted the responsibility of keeping the District Officers informed of cases of plague or suspicious illness, and of giving them general assistance in the carrying out of the necessary sanitary measures; where this duty is loyally performed, I should be sorry to propose any change. There are, however, a few localities in which little or no help is given by the Committees, and should they remain apathetic and indifferent in the event of a serious recrudescence of the epidemic, it may be necessary to substitute a more efficient agency—I have, &c.,

W. L. HARVEY,

Acting Municipal Commissioner.



*Instructions for District Officers during the Rains.*

The District Officer is the Chief Plague Authority of a ward, having general control over all plague operations in his ward, and he is responsible for seeing that all members of the establishment under him work properly.

He will work in co-operation with the staff of the Health Department, and should bring to the immediate notice of the <sup>District Health Officer</sup><sub>Inspector,</sub> any cases of insanitary buildings, gullies, drains, &c., which do not come within the scope of his duties as simply a plague officer. For instance, a house in which a case of plague has occurred will be cleaned as far as possible, by the District Officer's own staff; but the cleansing of dirty gutters, &c., in other cases is the business of the Health Department, and any instance discovered should be reported at once to the <sup>District Health Officer</sup><sub>Inspector.</sub> As Plague authority, the duties of the District Officers will fall under the following heads:—

- (a) To make himself thoroughly acquainted with his charge, and see that his establishment is sufficient and duly distributed.
- (b) To organize Local Committees, see to the distribution of work among the members so that the whole area is kept under regular observation, and to arrange for regular meetings, to hear grievances and discuss difficulties. Notes should be kept of the work done by each Committee member, and a report made about any Committee which is neglecting its work.

*Note.*—During the rains all assistance which members of the Local Committees or other gentlemen may give is to be accepted, but District Officers should refrain from pressing volunteers to carry on inspections which may be repugnant to them in bad weather, and may result in a difficulty in getting assistance later on.

- (c) To obtain immediate information of plague cases.

The members of the Local Committees are for the most part gentlemen with business of their own, who can spare but a few hours a day for plague work. It is necessary, therefore, to supplement their efforts, and the District Officer should see that his own inspectors and those of the Health Department keep a careful watch over all houses. A good Inspector should know by sight all the people in his charge, and by his local knowledge and the help of informers should be able to learn at once of any case of sickness or death.

- (d) To have made (where not yet done) and regularly kept up a plague register of every house in the ward. Every death, whether from plague or other causes, should be entered in this register, distinguished by red entries for plague and black for other causes. This is a most important duty, and special attention should be paid to it. The cause of death as shown in the cemetery returns is often unreliable, but when the register shows that a particular house or a particular street has had an unusual number of deaths, to whatever cause ascribed, special attention should be paid to that house or street. Information for the register will be obtained from the cemetery returns, from the reports of Local Committees, and from information obtained from the District and Health Department staffs.
- (e) To watch the migration of and mortality among rats. Directly an increase of rats is noticed in any locality, every effort should be made to destroy them, and any place in which dead rats are found should be thoroughly disinfected at once.

- (f) To see that patients are removed from infected dwellings with relatives and dependents.

Steps will be taken as soon as possible to arrange all hospitals on the plan of the Maratha, so that there may be no division of families, and unless the relatives specially desire it, the patient and all "contacts" should, whenever possible, be sent to the same place. In selected cases the patient may be left in his house and treated there, but care must be taken that the house is suitable, that it is kept clean and disinfected, the patient provided with a cot and other sanitary rules observed. Careful notes of any such case should be kept. Two attendants should be retained for each patient, and the other members of the family sent to a contact camp, unless they prefer to be inoculated and remain, when they should be registered and kept under observation.

- (g) To disinfect infected houses. Now that plague has almost ceased, it is most important that every effort should be made to get rid of it entirely. When a death is known to be due to plague, there is no question about disinfecting, but when the cause of death is doubtful, it is advisable to be on the safe side and disinfect, so as, if possible, to leave no locality, where the plague germ may be dormant for some months only to spring up afterwards with greater virulence. Whatever disinfectant is used, the chief points to be remembered are light, air and thorough cleanliness. During the rains tiles cannot be removed, but where possible doors and windows should be taken off their hinges. Every corner of the house must be swept out, all rags, refuse, &c., burnt and the surroundings cleaned up. If this is well done, there is fair chance of the germ dying. It has been the practice hitherto when a case of plague occurs in a chawl to disinfect only the room in which the patient was lying, and one room on each side. This practice should be adhered to, but when a chawl is obviously badly infected, the whole of the occupants should be removed to a health camp and the chawl disinfected and cleaned from top to bottom. The District Officer should satisfy himself by personal inspection that the work has been properly done, and should note in his house register the dates of vacation, disinfection, and re-occupation.

- (h) To supervise the camps in his ward. The District Officer will have control over all camps in his ward, seeing that they are kept in proper sanitary order, that registers are maintained, all inmates regularly inspected, and that all requirements, which he cannot himself supply, such as drainage water and latrine accommodation, are promptly brought to the notice of the Municipal Commissioner. The camping space in Bombay being limited, it is necessary that people should occupy the huts as short a time as possible, subject to a minimum period of fourteen days. The District Officer will therefore see that as far as his own ward is concerned, houses from which evicts are received in the camp are prepared for re-occupation as quickly as possible, and that officers in charge of other wards are duly informed that evicts from their wards can no longer be kept in the camp. Every officer wishing to send evicts to a camp not in his own ward should enquire first of the officer in charge of the camp whether accommodation is available.

The District Officer in charge of a camp will also be responsible for the due distribution among indigent evicts of any charitable funds placed at his disposal, and should always consult the officer who sent the evict before making a grant, as otherwise people will fraudulently obtain double doles.

- (i) Over hospitals the District Officer, if not the Medical Officer, will merely exercise a general supervision in matters not purely professional. Being in almost all cases an officer of one of the Indian Services, he will give his advice on questions of caste, &c., when the Medical Officer in immediate charge is unacquainted with the customs of the country, and he will see that the wants of the hospitals in the way of furniture, establishment, &c., are supplied.
- (k) To issue passes to people going up-country. In connection with this subject it is to be noted that in view of the possibility of a recrudescence of plague it is desirable that people doing business in Bombay should be encouraged to take their families away now to their native places and leave them there. The risk both to the families and to the remaining population will thereby be greatly diminished, and the difficulty hitherto experienced in dealing with women and children will be removed.
- (l) Lastly, the District Officer should see that all returns are punctually submitted. He should keep a brief diary of his own inspection and should enter in his weekly progress report an account of the work done by his Local Committees and his District staff.



CHAPTER II.

THE COURSE OF THE EPIDEMIC.

Population in  
Bombay.

The following statement very roughly indicates the population in Bombay at the beginning of each month from 1st July 1896.

The figures are taken from Mr. James's Chart No. 1, which are based on the average receipts of the Tramway Company. They have been checked by the figures of emigration and immigration supplied by the Collector of Bombay, and though they have no pretensions to accuracy, they are sufficiently good estimates.

—					1896-97.	1897-98.	1898-99.
1st	July	...	...	...	850,000	750,000	829,000
	August	...	...	...	850,000	775,000	829,000
	September	...	...	...	850,000	800,000	885,000
	October	...	...	...	850,000	810,000	885,000
	November	...	...	...	761,000	820,000	920,000
	December	...	...	...	797,000	850,000	950,000
	January	...	...	...	640,000	900,000	950,000
	February	...	...	...	447,000	775,000	875,000
	March	...	...	...	467,000	725,000	827,000
	April	...	...	...	485,000	737,000	743,000
	May	...	...	...	665,000	750,000	755,000
	June	...	...	...	732,000	800,000	774,000
Total					8,394,000	9,492,000	10,228,000
Average for the year in round numbers.					700,000	790,000	850,000

Plague at-  
tacks and  
deaths.

The following shows the total recorded number of plague attacks and deaths in each section during the year ending 31st May 1899.

Wards, &c.	Sections.				Attacks.	Deaths.
A	{	Upper Colaba	...	...	31	45
		Middle & Lower Colaba	...	...	630	464
		Fort, Southern	...	...	75	2
		Fort, Northern	...	...	554	463
		Esplanade	...	...	173	129
B	{	Mandvi	...	...	985	932
		Chukla	...	...	373	282
		Umarkhadi	...	...	768	648
		Dongri	...	...	1,017	710
C	{	Market	...	...	914	713
		Dhobi Talao...	...	...	637	489
		Fanaswadi	...	...	515	406
		Bhuleshwar	...	...	681	519
		Khara Talao...	...	...	494	336
		Khumbharwada	...	...	995	906
D	{	Khetwadi	...	...	667	569
		Girgaum	...	...	570	748
		Chowpati	...	...	292	163
		Walkeshwar	...	...	226	121
		Mahalakshmi	...	...	448	225
E	{	Mazagon	...	...	1,150	711
		Tarwadi	...	...	331	490
		2nd Nagpada	...	...	363	246
		Kamathipura	...	...	864	836
		Tardeo	...	...	688	586
		Byculla	...	...	1,751	1,312
F	{	1st Nagpada	...	...	371	273
		Parel	...	...	567	766
		Sewri	...	...	246	191
		Sion	...	...	315	259
G	{	Mahim	...	...	678	626
		Worli	...	...	497	408
		Water Division	...	...	4	8
		Non-resident and Unknown...	...	408	225	
Total				19,278	15,807	

Total  
mortality.

mor-

The following statement shows by sections the average yearly mortality and the actual mortality for three years, from 1st June 1896 to 31st May 1899, together with the average population and the death-rate per mille.

Wards, &c.	Sections.	Average. Mortality for 5 years from 1891.	Actual Mortality.		
			1896-97.	1897-98.	1898-99.
<b>A</b> {	Upper Colaba ... ..	114	164	131	135
	Middle & Lower Colaba ...	337	670	804	873
	Fort, Southern ... ..	29	37	25	12
	Fort, Northern ... ..	931	1,316	2,025	1,507
	Esplanade ... ..	167	143	254	446
<b>B</b> {	Mandvi ... ..	1,455	2,422	2,364	2,794
	Chukla ... ..	1,269	1,910	2,255	1,921
	Umarkhadi ... ..	2,113	3,458	3,524	3,766
	Dongri ... ..	1,165	1,820	2,142	2,461
<b>C</b> {	Market ... ..	1,140	1,503	2,168	1,898
	Dhobi Talao ... ..	1,297	2,171	2,590	1,874
	Fanaswadi ... ..	555	870	1,127	1,000
	Bhuleshwar ... ..	1,181	1,846	2,286	2,029
	Khara Talao ... ..	1,125	1,773	2,048	2,010
	Khumbharwada ... ..	1,152	1,599	2,369	2,729
<b>D</b> {	Khetwadi ... ..	784	1,349	1,780	1,954
	Girgaum ... ..	965	1,577	1,999	1,782
	Chowpati ... ..	201	335	423	395
	Walkeshwar ... ..	236	437	253	307
	Mahalakshmi ... ..	280	578	500	631
<b>E</b> {	Mazagon ... ..	998	2,071	2,336	2,386
	Tarwadi ... ..	522	937	1,105	1,516
	2nd Nagpada ... ..	938	1,725	2,132	1,853
	Kamathipura ... ..	1,370	2,753	3,272	2,668
	Tardeo ... ..	781	1,394	1,636	1,723
	Byculla ... ..	1,667	3,415	4,804	4,686
	1st Nagpada ... ..	393	608	738	798
<b>F</b> {	Parel ... ..	1,217	1,932	2,727	2,705
	Sewri ... ..	180	430	295	464
	Sion ... ..	446	1,197	872	935
<b>G</b> {	Mahim ... ..	587	1,666	1,234	2,086
	Worli ... ..	569	1,543	1,143	2,030
	Water Division ... ..	70	55	83	61
	Non-resident and unknown ...	615	2,492	2,283	892
	Total ... ..	26,849	48,496	55,727	55,327
	Average population ... ..	8,50,000	7,00,000	7,90,000	8,50,000
	Mortality per mille ... ..	31.58	69.23	70.54	65.09

Mortality of  
the City as a  
whole.

Diagrams showing the rise and fall of the general death-rate in Bombay as a whole and for each section of the City are attached to this report. Except a brief out-break of cholera at the beginning of the monsoon of 1897, no other epidemic of serious importance has appeared in the City during the past three years. The line of general mortality may therefore be taken as a safe index to the rise and fall of plague. Referring first to the diagram for the whole City, it will be seen that the



mortality began to rise slowly at the end of June 1896, reaching nearly 800 in the week ending 6th October. In the week ending 20th October it fell to about 600, and then rapidly rose to over 1,800 in the week ending 29th December. It remained at high level for 7 weeks, reaching 1,900 in the week ending 19th February; after which it rapidly decreased till it was normal in the week ending 4th May.

In the second year it was practically never normal; a serious recrudescence began from the middle of July, reaching its height 1,050 in the week ending 3rd August. It then decreased steadily till the middle of November. After the first week of December, it rose rapidly to 2,200 in the week ending 15th February, remaining at high level for 6 weeks, in the last of which ending 22nd March it reached 2,250 and then fell rapidly till it reached normal in the week ending 17th May, or only a fortnight from the close of the year.

In the third year the mortality began to rise at the beginning of July, reaching 1,000 in the week ending 4th October. It then fell to below 600 for the week ending 22nd November. It again rose slowly for a month, and then rapidly for two months reaching its maximum of 2,400 in the week ending 8th March. It remained at this high level for three weeks only, and then fell rapidly, but did not reach normal till the beginning of the following year.

Mortality of  
each section.

A careful study of the Charts of the total mortality, which have been prepared for each section, would afford support to the most diverse theories as to the progress of the disease. But, speaking generally, it seems to have spread outwards from Mandvi in the first year, to have started in the very centre of the City in the second year, and to have spread from there in every direction, and in the year under report to have spread from 3 separate centres, *viz.*, Mahim, North Fort, and the centre of the City. But when it is remembered that hardly any portion of the City has ever been really free from plague for any length of time, many sections undergoing a recrudescence of greater or less severity during the monsoon, and when the busy going-to-and-fro of Bombay is taken into account, the hopelessness of theorizing about the progress of the disease from place to place becomes apparent; even if the suggestion put forward by many that the bacillus from time to time becomes dormant, again springing into vigorous life under suitable conditions, is left out of the question.

The following table gives the approximate dates on which the main outbreak of the year began in each section :—

22nd November 1898—2nd Nagpada.

29th November 1898—Fort North, Dongri, Kumbharwada, Mahim.

6th December 1898—Market, Kharatalao, Byculla.

13th December 1898—Mandvi, Dhobitalao, Mazagon, Parel, Worli.

27th December 1898—Umarchari, Bhuleshwar, Fanaswadi, Kamatipura, Tardeo, 1st Nagpada, Sion.

3rd January 1899—Middle and Lower Colaba, Khetwadi, Girgaum, Tarwari, Sewri.

10th January 1899—Chukla, Mahalaxmi.

24th January 1899—Chowpatti.

31st January 1899—Walkeshwar.

7th February 1899—Esplanade.

#### A Ward.

*Fort South.*—From the statement of total mortality it will be seen that Fort South has been practically free from the epidemic throughout. This is no doubt due to the fact that it is not a residential quarter, but is almost entirely occupied by offices of a substantial character; it is comparatively speaking, well-drained, well ventilated, clean and dry.

*Upper Colaba* has also been very lightly touched. After Fort South it has the smallest population of any in Bombay, and a considerable proportion consists of Europeans and European Troops, it is well separated from the rest of Bombay, is well ventilated and exposed to every breeze that blows, and its health and sanitary condition has been vigilantly watched by the Military authorities.

*In Middle and Lower Colaba* after a slight recrudescence in September and the beginning of October, the mortality began to rise at the beginning of January, attained its maximum 9 weeks later in the week ending 14th March 1899; remained there for a fortnight and then fell irregularly till the end of the year, the whole course of the main epidemic lasting 22 weeks. There were 203 deaths more than in 1896-97, and 69 more than in 1897-98.

*In Fort North* matters took a distinct turn for the bad in the week ending 6th December 1898, the mortality was at its worst for 5 weeks from the middle of February to the 3rd week in March and then declined till it reached a comparatively normal figure at the end of April: the whole course of the epidemic having lasted 21 weeks. The chart for this Section shows vividly the rapid rise and fall and the virulence of the disease in the epidemic of the previous year, when in one week the mortality was nearly 10 times the normal. There was a difference of 518 lives in favour of the year under report, which is equivalent to the average mortality of 6 months.

*In the Esplanade*, an extended but open and thinly populated area, the mortality began to rise seriously in the week ending 7th February 1899; the epidemic lasted 16 weeks, remaining at its highest level for the last 4 weeks of March. During this period it was between 9 and 10 times the normal. The epidemic in this section has increased in virulence each year, and it shares with Mahim and Worli the unenviable distinction of a mortality this year, approaching double of that of 1897-98.

The following general remarks regarding A Ward are taken from Captain Lock's report:—

“Colaba Village is a densely populated neighbourhood off the South side of Colaba Road—intersected by short narrow lanes crossing and re-crossing. The residents are for the most part coolies, cartmen, fishermen, mahars, and sweepers. It was in this village that plague first broke out, showing itself especially in



“Thomas Street, spreading in September 1898, to Pilot Bunder, and involving the whole village. The rest of Colaba except for a few dropping cases kept clear until the 15th January, when Victoria Bunder, about  $\frac{1}{2}$  a mile up the Colaba road, became seriously affected and from that date to the 31st May there were 168 cases in this 12-acre patch of ground alone. Colaba Road which is the residence of Europeans chiefly, of different nationalities, had 29 cases during the year entirely among servants. Contamination was often found to have been got from staying with or visiting friends in Colaba Village and Victoria Bunder.”

The previous history of Victoria Bunder is interesting. In the time of General Gatacre Plague was very bad in some insanitary chals standing here. They were eventually demolished in the hot weather of 1897. The people were exceedingly reluctant to leave ; they camped out in the open, and when the monsoon broke they were in such distress and misery that the erection of temporary sheds was permitted, a certain number being put up by the Municipality itself. In the year under report there were some 2,000 people living in these huts, the surroundings were most insanitary and it was found impossible to make the landlord take the matter seriously in hand. Plague attacked the residents very severely, and extended to those of pakka chals in the immediate neighbourhood ; and finally at the close of the year it was decided that this death-trap must be abolished once for all. The demolition of the huts has been going on by degrees ever since and at least one plague centre has now been removed.

It was very difficult to catch hold of plague in the North Fort section. It broke out here, there and everywhere ; and assumed epidemic proportions first in one locality and then in another without any apparent rhyme or reason.

**B Ward South.** *Mandvi* went through two distinct epidemics which practically lasted the whole year. Beginning on 21st June the first epidemic remained at a high level from 23rd August to 11th October—7 weeks—and the mortality did not touch normal till the middle of December. It started to rise again almost at once and by irregular jumps reached its maximum (106) in the week ending 21st March 1899 ; after which it decreased till the end of the year. The entire course of the first epidemic lasted 25 weeks, of the second 22 weeks. The chart shows that both the previous years were marked by a similar mortality line, but the mortality was in both years lower, except during the fierce outbreak of the 1st three weeks at the beginning of October 1896, which ushered in the first epidemic in Bombay. The mortality during the year under report (2,794) exceeded that of the 1st year by 372 and that of the 2nd by 430.

In *Chuckla* there was a slight recrudescence during the monsoon, the mortality attaining a rate of 45 during the week ending 27th September 1898, but the epidemic really began about the 10th January. The death-rate rose for 7 weeks, was at its height for 6 weeks from 28th February 1899 to 11th April 1899, and then fell till the end of the

year : covering altogether a period of 21 weeks. The total loss of life (1,921) was about the same as in 1896-97, but less by 334 than in 1897-98. In neither Mandvi nor Chuckla does the disease seem to have spread from any definite centre.

**B Ward North.**

*Umarkhari*, like Mandvi, is marked by two distinct epidemics. The first began about July 7th, reached its height 7 weeks later at the end of August, remained high, with one remarkable drop during the week ending 20th September, for 7 weeks, and reached normal during the week ending 15th November 1898, having lasted 18 weeks. The second and more serious epidemic started about 27th December, increased irregularly for 7 weeks, remained high for 6 weeks, with a maximum of 128 in 2 successive weeks, then gradually fell to normal at the end of year, the whole epidemic lasting 21 weeks. The chart shows that in the first year there was only one epidemic; in the second a slight recrudescence in the monsoon was followed by a serious epidemic during January and February. The total mortality of the year under report (3,766) exceeded that of the first year by 308 and that of the second year by 242.

*Dongri* presents very similar features—a minor epidemic in the monsoon, beginning about 11th August, increasing to a maximum of 59 in the week ending 11th October 1898, and again reaching about normal after the 1st week in November, a total period of 14 weeks. The second epidemic began slowly about 1st December 1898, and after 8 weeks reached 102 in the week ending 7th February 1899, remained high for 7 weeks, and again reached normal in the last 7 days of the year after a course of 25 weeks. The mortality line of 1897-98 followed that of the year under report, but in the first year there was only one epidemic. The mortality of Dongri for 1898-99 (2,461) exceeded that of 1896-97 by 641 and that of the intermediate year by 319.

**C Ward**

*Market*.—A slight recrudescence occurred in September-October. The real epidemic began about 6th December 1898, the mortality after rising for 4 weeks remained high for 12 weeks, then fell to normal about a fortnight before the close of the year, having lasted 23 weeks.

*Dhobitalao*.—There was no recrudescence during the monsoon. An epidemic began about 15th December 1898, the death-rate increased for 5 weeks, maintained a high level for 7 weeks, and fell to normal after the close of the year, having lasted 24 weeks.

*Fanaswadi*.—There was no recrudescence, but an epidemic began on 27th December 1898, the mortality increased for 4 weeks, and after remaining high for 6 weeks, fell to approximately normal about the 11th April, having lasted 15 weeks.

*Bhuleshwar*.—A slight recrudescence occurred in September-October. The real epidemic started about 27th December 1898, increased for 5 weeks, maintained a high level for 7 weeks and fell to normal a fortnight before the close of the year, having lasted 20 weeks.



*Kharatalao*.—There was a recrudescence in August. The more serious epidemic began about 6th December 1898, increased steadily for 12 weeks to a maximum of 83 in one week, then declined steadily to the end of the year, having lasted 25 weeks.

*Kumbharwada*.—A serious recrudescence in August, September and October was followed, practically without any break, by an epidemic beginning 29th November 1898. The mortality increased irregularly for 16 weeks and did not again reach normal till the last few days of the year, having lasted 25 weeks.

If the mortality curves of the charts of the first 4 of the above sections be examined, a striking similarity of feature during the latter half of the year will be observed. In each case the epidemic of 1897-98 was far worse than that of either the preceding or the succeeding year. In each case the epidemic of 1896-97 reached about the same virulence as that of 1898-99. In Kharatalao the 3 epidemics have been on a diminishing scale and have reached their height about a month later each year. In Khumbharwada they have been a few weeks later each year, but on a crescendo scale. The total mortality for "C" Ward during 1898-99 (11,540) was heavier by 1,778 than in 1896-97, but less than that in 1897-98 by 1,048.

#### D Ward.

*Khetwadi*.—Two slight recrudescences in August and October were followed by an epidemic beginning 3rd January 1899, rising to a maximum of 103 in the week ending 28th March 1899 (*i.e.*, after 12 weeks), then falling to normal at the end of the year after 21 weeks.

*Girgaum*.—No monsoon recrudescence. An epidemic started on 3rd January 1899, and rising to its maximum of 132 for the week ending 28th February 1899 (*i. e.*, after 9 weeks), fell to normal 3 weeks before the close of the year after a course of 16 weeks. As last year the epidemic in Girgaum was briefer, but more severe than in Khetwadi, but the diagrams show a strong general resemblance. In both sections the epidemics began simultaneously, and in each section the second epidemic was the worst, that of the year under report coming second in severity. But taking the whole year into consideration the effects of the monsoon recrudescence during the year under report on Khetwadi are shown by the high total mortality. The number of deaths (1,954) was 174 more than in 1897-98 and 605 more than in 1896-97. In Girgaum the total this year (1,782) was 205 more than in 1896-97, but 217 less than 1897-98.

*Chowpatti*.—No monsoon recrudescence. An epidemic began on 24th January 1898. The death-rate fell to normal in one week, but otherwise rose fairly steadily to a maximum of 46 in the week ending 14th March 1899. It then began to fall at once and became normal after 18th April, having lasted 12 weeks only. But the virulence of the



disease was very great during the maximum week, the mortality being eleven times the normal. The epidemic followed a very similar course to that of the previous year, both in point of strength and time. That of the first year was a month and a half earlier. The total mortality this year (395) was 60 higher than in 1896-97, and 28 lower than in 1897-98.

*Walkeshwar*.—There was no monsoon recrudescence, and no very serious epidemic, but the mortality rose from 31st January 1899 for 8 weeks till it attained a maximum of 25 (or six times the normal) in the week ending 28th March 1899, reaching normal again 3 weeks before the end of the year after a course of 14 weeks. The recrudescence of the previous year followed very much the same lines, but was less severe. The epidemic of 1896-97 was a month and a half earlier and more serious. The total mortality this year (307) was 54 higher than in 1897-98, 130 lower than in 1896-97.

*Mahalaxmi*.—There was no recrudescence in the monsoon, but an epidemic in the hot weather. The mortality rose from 10th January 1899 for 7 weeks, remained at high level 4 weeks (maximum 42, or eight times the normal, in the week ending 28th March 1899), then fell rapidly lasting altogether 14 weeks. The epidemic of the previous year was less severe, but followed much the same lines; there was, however, a slight monsoon recrudescence that year; in 1896-97 the epidemic was about the same in violence as during the year under report, but a month earlier. For the whole year the mortality (631) exceeded that of 1896-97 by 53, and that of 1897-98 by 131.

As regards the August recrudescence in Khetwadi, Captain Dunbar Stuart writes: "The people of 2nd and 3rd Khetwadi Lanes and their vicinity probably brought the infection from Mandvi and Dongri, where the Khetwadi people work." Mandvi has much to answer for and was practically never free, but the monsoon recrudescence in Dongri began a fortnight later than in Khetwadi. The second monsoon recrudescence in Khetwadi is ascribed by Capt. Stuart to the very virulent infectiousness which seems to have attached to the case of Dr. Chonkar—referred to elsewhere—and those that arose from it.

#### **E Ward.**

*Byculla*.—The mortality diagram of this section presents a dismal spectacle. From the beginning of June 1896 to the end of May 1899, the death-rate has only been normal during 3 weeks. It is probable that the population of this section has with that of the rest of the North of the island increased in a greater ratio than in the Southern and Central portions. The number of mills in Bombay has greatly increased in recent years, and the additional mill-hands are largely accommodated in Parel and E Ward. It is not at all improbable that the population of the section has increased by ten thousand, and this would go far to account for the high level of the death-rate. But even if the average

weekly rate be taken at 40 instead of 31, a distinct recrudescence is observed in September and October; and the more serious epidemic starting about 6th December 1898, rose rapidly to a maximum death-rate of 262 in the week ending 7th March 1899 and lasted to the end of the year—a total period of 25 weeks—though its fall was as rapid as its rise. The total mortality of the year (4,686) was 1,271 greater than in 1896-97 and 118 less than in 1897-98. But in that year a sharp outbreak of cholera during the monsoon went to swell the figures. In the earlier stages plague jumped about without much method from one portion to another of this large section, but when the epidemic once seriously started the whole of Byculla was thoroughly infected.

*Mazagon.*—There was a very slight recrudescence at the end of September, but the real epidemic began about 13th December, and the death-rate after rising to a maximum of 163 in the week ending 28th March 1899 fell rapidly. The epidemic lasted till the end of the year—a total period of 24 weeks. Its progress through the section was from South to North. The epidemic of 1897-98 covered approximately the same period, that of 1896-97 was about 2 months earlier. The total mortality this year (2,386) was 315 greater than in 1896-97 and 50 greater than in 1897-98. In that year, as in Byculla, there was a specially high mortality in September.

*Tarwari* had a slight recrudescence in October, the epidemic began about 3rd January 1899, increased for 8 weeks, maintained a high level for 3 (maximum 111 in the week ending 21st March 1899), and was not far from normal at the end of the year after a course of 21 weeks. The violence of the epidemic was considerably greater than in either of the preceding years and the total mortality (1,516), which was 200 per cent. above normal, exceeded that of 1896-97 by 579, and that of 1897-98 by 411.

*Kamatipura.*—A recrudescence in September was followed by an epidemic beginning about 27th December 1898, rising gradually for 10 weeks, to a maximum death-rate of 117 in the week ending 7th March 1899. It began to fall steadily a fortnight later, and the death-rate was normal during the last week of the year, after a course of 21 weeks. The epidemic followed very much the same line as in the preceding year, but was less severe, and both the monsoon recrudescence and the epidemic were a few weeks later. The total mortality this year (2,668) was less by 85 than in 1896-97, and by 604 than in 1897-98.

*Tardeo.*—After a brief recrudescence at the end of September and the beginning of October, the mortality rose steadily for 9 weeks from 27th December 1899, maintained a high level for 4 weeks, with a maximum of 94 in the week ending 7th March 1899, and was again normal at the end of the year, having lasted 21 weeks. The period of rise and fall thus synchronised closely with that of Kamatipura. The epidemic lasted longer than in either of the preceding years and the total mortality (1,723) exceeded that of 1896-97 by 329 and that of 1897-98 by 87.



*1st Nagpada.*—The mortality was above normal for a considerable portion of the rains, but it can hardly be said that there was a recrudescence. The same thing occurred during December, but it was not till about the 27th of that month that a marked rise commenced. The maximum (51) was reached in the week ending 28th February, and the epidemic was over at the end of April, having lasted 18 weeks. The total mortality (798) exceeded that of 1896-97 by 190 and that of 1897-98 by 60.

*2nd Nagpada* had a serious recrudescence during September and a comparatively slight epidemic later. This began about 22nd November 1898 and, after 13 weeks, reached its maximum (71) in the week ending 28th February 1899, the mortality reaching normal just before the close of the year, after a total course of 26 weeks. The mortality line of the previous year was very much the same in this section, but generally higher. The total mortality this year (1,853) was greater than that of 1896-97 by 128, less than that of 1897-98 by 279.

#### F Ward.

*Parel.*—The mortality was high throughout the year, but the epidemic did not begin till 13th December 1898, rose for 15 weeks to a maximum of 146 in the week ending 28th March 1899 and then, falling rapidly, reached normal at the close of the year, having lasted 23 weeks. The section escaped the serious monsoon recrudescence of the previous year and the total mortality (2,705), though more than that of 1896-97 by 773, was less than that of 1897-98 by 22.

*Sewree.*—There was no monsoon recrudescence here, an epidemic commenced 3rd January 1899; the death-rate rose for 8 weeks to a maximum of 36 (9 times the normal), in the week ending 7th March 1899, and after maintaining a high level for 6 weeks fell to the average a fortnight before the close of the year after a total course of 19 weeks. The epidemic was more severe than either of its predecessors, the mortality for the year (464) exceeding that of 1897-98 by 169 and that of 1896-97 by 34.

*Sion.*—This section had a monsoon recrudescence in 1897-98, which it escaped during the year under report. But the rising mortality showed the commencement of an epidemic about 27th December 1898. It went on increasing for 11 weeks to a maximum of 51 in the week ending 21st March 1899: the curve then descending irregularly to the close of the year—a total period of 22 weeks. This section suffered very severely in 1896-97 and the total mortality that year exceeded that of the year under report (935) by 262. In 1897-98 the figure was 872.

#### G Ward.

*Mahim.*—The mortality was high throughout the year. This is probably to some extent accounted for by a rapidly increasing population. The epidemic began 29th November 1898, rose for 15 weeks to a maximum of 122 deaths in the week ending 21st March 1899, then rapidly fell to the close of the year—a total period of 26 weeks. The epidemic was much more severe than in 1897-98. The total mortality this year (2,086) exceeded that of 1896-97 by 420, that of 1897-98 by 852.

*Worli.*—The mortality was distinctly high throughout the year. The epidemic began about 13th December 1898, rose for 12 weeks to a maximum death-rate of 121 in the week ending 14th March 1899, and then fell to the close of the year—a total period of 24 weeks. It was, however, at the end of the year still considerably above normal. The epidemic exceeded both its predecessors in intensity; the total mortality (2,030) being greater than that of 1897-98 by 887 and than that of 1896-97 by 487.

This large district constitutes the suburbs of Bombay, and includes a number of villages of various sizes. The disease appeared in epidemic form first in Parel during the latter half of December; Elphinstone Road and Jacob's Circle were next attacked in the beginning of January; Bhoiwada, Naigaum, Sewri and Worli, during February, and Dharavi not till the end of March. Elphinstone Road and Jacob's Circle were clear by the beginning of April, but cases continued to occur elsewhere except where it was possible to evacuate the entire infected localities. The epidemic seemed to follow no regular course, but would jump from one locality to another and subsequently return to intervening areas in an entirely arbitrary manner.

General Remarks regarding the localities attacked by plague.

Lieutenant Brackenbury in charge of Mandvi and Chukla makes the following interesting observations:—

“Except in a few instances, up to the middle of March, the disease attacked the people not the houses. Those people escaped whom the landlord compelled to live under sanitary conditions, and only in those houses where no one was allowed to come and live without being asked where he came from. In this way they prevented the infection being introduced, or, when it was introduced, spreading. During the months of March and April, when the disease attacked the houses (through rats), scarcely any of the houses built over godowns escaped. These godowns and the houses over them are always infested with rats. It was most remarkable that in Mandvi while all the people were coming to me with tales of rats dying, and I was finding how useless it was sending only patients out of the house to stop the spread of the disease, in Chukla I heard no such stories, and I found that if I sent the patient to hospital as I had been doing, this measure was quite sufficient to prevent further cases. There are no godowns underneath the houses in Chukla. When the disease attacked houses, it seemed to attack all alike,—badly ventilated, dark overcrowded chawls in which poor Ghattis live, as well as the large airy buildings of the richer merchants.”

So much for Mandvi and Chukla. Speaking of Bombay as a whole the epidemic seems to have begun this year smouldering in insanitary spots, then laying hold of them—first one, then another—gradually tightening its grip upon them—making little excursions from them and then suddenly flaring up into a general blaze all over the district attacked. There is a consensus of opinion among the District officers that want of light and ventilation, overcrowding, filth and dampness, and defective drainage—in a word defective sanitation—were almost universal characteristics of the localities chiefly attacked, but exceptions to this



were numerous. Captain Lock remarks on the virulence of the disease in Borah Bazaar Street in the Fort :—

“ The houses are of good quality—the rooms large and airy—while the majority of the occupants were away in Camps. Most of the cases were among the servants left in charge ; but my opinion is that the cause of plague was the defective drainage and the dampness of the ground floors.”

Captain Cuppage, after noticing how often well constructed, and thoroughly sanitary buildings, apparently became infected through the unhealthiness of the locality in which they were situated, gives a striking example of a building, erected on sound principles and kept thoroughly clean, remaining free from plague while the scourge was raging fiercely round it :—

“ Situated between old and new Sonapur Lanes in the Dhobi Talao Section, this building shows a clean bill, not having recorded a single case of plague since the first outbreak up to date, though placed in the heart of a highly-infected centre.”

Contrast with this another example cited by him :—

“ A very noticeable feature with reference to this locality (New Hanuman Lane) is that, though plague raged in the most virulent form all round it, a small area, known as Angria's Wadi, remained perfectly immune until the month of January, notwithstanding the fact that it is most insanitary and thickly populated by a caste known as Karwas, and the houses in it are dark, low, damp and densely packed.”

Captain Stuart, too, after noticing the general tendency of plague to attack insanitary places, notices various localities which were an exception to this rule, thus :—

“ (1) Goregamker in Girgaum, inhabited by Brahmins—an exceptionally clean race—had a good deal of plague. The chaul is clean and well-ventilated. The cases were probably imported, the infection being kept up through concealment.

“ (2) Kotachiwadi—Inhabited by Native Christians, who do not mix much with those around them, had a good deal of plague. The place looks clean ; and till the appearance of rats enjoyed good health. Every house had one or more rats.

“ (3) Walkeshwar.—In the servants' quarters plague was discovered, but not very much, mostly in Harkness Road, and Narayen Dabholkar Street,—rats must have been the cause, they were found in the latter place. In one bungalow a girl got plague in the servants' quarters just one year after the last case, exactly in the same spot, though the former rooms had been razed to the ground, and new quarters built with a higher plinth.”

And again in a circle formed by nine good houses in Mahaluxmi, 32 cases occurred, and are ascribed by the District Officer to the malevolent influence of rats.

#### Influence of Rats.

It is exceedingly difficult to obtain any precise information, either about the movements of, or the mortality among, rats. A certain proportion of the more enlightened realised that the finding of dead rats upon their premises indicated the presence of danger, and hurried to give information to the District Officer with a view to the place being disin-

fectcd ; there were others who realised the danger and ran away from it, but deliberately abstained from giving any information so as to avoid disinfection. But the greater number either did not realize or preferred to take the risk, and simply ignored the death of rats. The following account of an outbreak of plague in Colaba, at the beginning of the year, shows how close is the relation between plague among rats and plague among human beings, and seems to show that rats undoubtedly can spread plague among human beings :—

“After a break of nearly two months a recrudescence of plague occurred in Colaba village in July 1898. It is a small thickly populated insanitary area at the extreme south of the Island. Not more than two or three dead rats were found, and these not in any particular house, but in the gullies between houses. Rats were, however, found in the houses of two Europeans in Middle Colaba : this was not brought to light until a case of plague had occurred in each house, one proving fatal. The dead rats had been found from six to seven days before the attacks. In the first week in September 1898, dead rats were found in large quantities in the compound of a disused bungalow in Upper Colaba adjoining a small native bazaar known as the Parsee Bazaar. The rats were not found until in a decomposed state and no medical examination was possible. On the 13th September a case of plague occurred in this bazaar, the occupants of the room were turned out and also the rooms on either side and the premises thoroughly disinfected. Cases, however, went on occurring, one or two a day, until the number reached 20, when the whole bazaar was vacated and the inhabitants camped out. One more case occurred three days later, and that was the last.”

The number of Europeans who have been attacked with plague during past epidemics has been markedly small, and in a large number of the cases that have occurred among them the attacks have been preceded by the finding of dead rats in their residences. This has been especially the case in Elphinstone Circle, which has produced more European cases than any other single locality. On this subject the District Health Officer, Dr. Cayley, wrote on 12th May 1899 :—

“The only part of Bombay practically in which Europeans have suffered to any extent from plague has been Elphinstone Circle. This, in my opinion, is due to the fact that there are double floors to these buildings, in which rats swarm. The space between the floors is foul. There were cases of plague in the house in question last year, as well as this year. The same is likely to recur next year unless something is done. I have looked at several of the houses where plague has occurred. They are mostly clean, light and airy. The double floors with the facilities they give for the breeding of rats are the main points in which these houses differ from other European houses, and I am confident that this is the cause of these houses being infected with plague.”

In view of these facts it was decided to call upon the owners of these houses to do away with the double floors.

No important observations were recorded during the year regarding the migration of rats ; but it very commonly occurred that when a house was attacked by plague, enquiry elicited that dead rats had been found a few days previously and that then all traces of rats had disappeared. It is a point difficult to establish that the rats brought



infection, but that is an almost universal opinion in Bombay: though occasional instances have been observed where plague infection has been carried by human beings from one house to another, and sickness in the second house has been followed by rat mortality.

Dead rats did not always mean plague among the residents in a house. In December 1898 large numbers of rats were noticed along the foreshore of Colaba at dusk, and writing at this time, the District Officer says :—

“Dead rats have been found in as many as 25 houses. In nearly every house they have been found off and on for at least 14 days before the fact was brought to notice. Each house was disinfected on receipt of information. In five of these houses cases of plague occurred.”

Endeavours were made to persuade the people to vacate their houses in all these cases; where the finding of rats had been followed by plague among the residents they went willingly enough; but when no one had been attacked with plague, and the rats had stopped dying, they could not see the necessity of leaving. It is, however, significant that the mortality in the Fort began to rise from the beginning of the month of December. In one case plague broke out simultaneously in two adjoining houses. In one lived Hindus, in the other Parsees. There was no intercourse between the residents, and the only point of community was that dead rats had been found in both houses shortly before. Instances constantly occurred all over Bombay where dead rats had been found a few days previously to the residents of a house being attacked with plague, and it was a common incident to find dead rats in cupboards or behind boxes when a house was being disinfected on account of plague, but in this as in most other respects it was difficult to collect precise information. Lieut. Brackenbury writes regarding B Ward South :—

“Dead rats in any numbers were never found by the Plague Staff, but there can be no doubt that from the middle of March 1899 to the middle of April 1899, *i. e.*, during the height of the epidemic in Mandvi, rats were dying in great numbers all over Mandvi. Everybody in the District acknowledged this, but owing to the dread entertained of having their houses disinfected and vacated, each house-owner resolutely denied that rats had died in his house.”

In C Ward during August and September, when there was a minor epidemic, reports were constantly being received of the finding of dead rats, and plague cases usually were reported at the same time or shortly afterwards. In Bhuleshwar and Khara Talao dead rats were frequently found in January and February when the epidemic began to rise. Captain Cuppage writes of the Market and Dhobitalao sections that rat mortality invariably preceded infection of the various localities. But places where dead rats were found were very systematically vacated and disinfected, and perhaps to this may be ascribed the lighter incidence of the epidemic in this ward during the year under report. From this ward it is reported that Plague almost always supervened if a house

remained tenanted when dead rats had been found. It is worth noting that during April and May when the epidemic was subsiding, houses which had been locked up and deserted by the residents were opened and disinfected prior to re-occupation, and in the course of this a few dead rats were constantly being found.

At the beginning of December the District Officer, D Ward, wrote that in the past three months reports of dead rats had been received from 19 places. In every case disinfection was promptly carried out. In seven instances cases of plague occurred within a week after the dead rats were found. In this district it was especially remarked that reports of dead rats were frequent at the time when the mortality began to rise in the various sections, but except on Malabar and Cumballa Hills little was heard about them when the epidemic was at its height. The District Officer holds strongly to the opinion that the rats moving from place to place took the plague with them. One case occurred when no less than 30 dead rats were found in a Marvari's shop, but no plague occurred in the vicinity.

Speaking generally of E Ward, instances have been frequent where dead rats have been found before plague appeared, and about a fortnight before the epidemic became really virulent they were being found all over the district in large numbers. This was especially marked in Byculia.

Dr. Godinho, Deputy Health Officer, doing plague duty in the Mazagaon section of this District, writes :—

“Early in January rats began to die. First at the southern end, then further and further north. When they were found by our disinfecting parties, they were either dead or listless, moving about rooms where water could be easily obtained. I may take this occasion to mention two interesting facts: A plague case had occurred in Gokaldas Wadi, No. 109. The patient had been brought during the night from elsewhere. This was a case of plague pneumonia. Four or five days after this, in the contiguous rooms on each side plague cases occurred. The patients were removed to hospital and the people to camp. When the rooms were being disinfected, so many as 14 rats sick and dying were found. This, I am inclined to think, was a case of infection from man to rat. Just the reverse obtained in Carpenter Street. Rats died in house No. 8; without giving the District Officer any notice, the owner closed his house and left Bombay. The neighbours were also ignorant of the fact. Two or three days afterwards, more rats died in the house and began to decompose. The neighbours then complained. It was too late—the rats of the locality were infected and began to die. A few days later, people began to take ill and die. Without any exception, every house in Carpenter Street suffered. The people moved into their own camp at Matunga. Dr. Pathare, a resident of that locality, whose house was the last to be attacked was also the last to fall a victim to the disease. It was afterwards ascertained that some dead rats had been found in the rear of the house near the privies.”

The District Officer, F and G Wards, as most others, found it difficult to obtain precise information on this subject; but he notes the almost complete disappearance of rats during the monsoon of 1898,



their re-appearance at the north end of the District during the cold weather, and a considerable mortality among them both in the north and south at the beginning of December, *i.e.*, just when the mortality *began* to rise in those directions.

#### Re-infection.

In B Ward South (Mandvi and Chakla), where the houses are for the most part fairly good, plague seemed at first to spread slowly from one man to another, the epidemic only becoming severe when the rats became badly infected and carried the disease into almost every house, but, speaking generally, plague attached itself to insanitary localities, and only after they had become thoroughly poisoned did the better class dwellings in the neighbourhood suffer. This feature of plague, which it doubtless shares with most other epidemic diseases, has been noticed in past years, and it was observed that localities, and even particular houses, which were badly affected in previous epidemics, were more liable to re-infection during the year under report.

The history of a plague epidemic naturally tends to become a history of insanitary areas—the out-break of plague in them, and the attempts made to free them from infection. The methods adopted were, briefly, removal of the sick to hospital, and of the healthy to camps, and the disinfection of the infected place. It can hardly be doubted that, if it were possible to simultaneously evacuate the whole or large portions of Bombay, and to keep the people in camp till rats had ceased to die and their houses had been disinfected, the back of an epidemic would be at once broken, though plague might linger on and break out again in a subsequent year.

But anything approaching evacuation on a sufficiently large scale is out of the question in Bombay, and the result was, and always has been, that though the temporary evacuation of a bad locality has stopped the epidemic there for the time being, and saved thousands of lives, these insanitary places are always liable to re-infection so long as the disease is prevalent. It may be brought in by rats, or by a man who has visited a sick friend, or in numberless other ways : and once it has obtained a fresh footing, the same conditions of filth and overcrowding, and of want of light and ventilation, help and foster it till the place once more becomes a plague centre. It thus frequently happened that neighbourhoods suffering from these defects were seriously infected more than once during the epidemic. Facts of this kind are the weapons of those who urge that plague measures are useless, and therefore intolerable. The lives that are lost arrest the attention ; no allowance is made for the lives that are saved.

#### The classes most liable to plague.

The people who suffered most were those who lived among the most insanitary surroundings, in other words the poorer classes. Capt. Pritchard writes :—

“ Their habits are often dirty and unclean, even the food they eat and their manner of eating. The ordinary duties which nature necessarily imposes upon all alike are executed by them often in the very room in which they sleep and eat, and almost as much of this is done inside as outside, to a distance of within a few paces of the house.”

Their standard of living is lower, their food not so good or plentiful, and they are handicapped in the power of resistance to the disease; Mussulmans, on the whole, suffered less than Hindus, and had a greater chance of recovery. The Khojas especially—a well-to-do and cleanly community—were very lightly touched; but a considerable proportion of them have at various times been inoculated. Of high-caste Hindus, those from Gujarat seem specially liable to the disease. Until, however, the Health Department Returns are tabulated, any accurate analysis of the incidence of plague upon particular communities is not possible. The comparative immunity of Europeans continued. Some officers have noticed that people living on ground floors and in attics suffered more than others. This may possibly be due to the greater dampness of the one, the overcrowding and want of ventilation of the other: more probably to the fact that rats mostly frequent the ground floor and roof.

Brief comparison of the epidemic with that of previous years.

The mortality chart for Bombay shows how the ascending curve of mortality was later than in previous years, so that the hot weather was established by the time it reached its maximum. That maximum was higher than in either 1896-97 or 1897-98, but the high level period lasted for three weeks only against seven in the first year and six in the second; and the decline began at the same time as in 1897-98. The medical officers in Bombay have noticed that during the year under report the virulence of the disease, the rapidity of its course in the individual patient, and the case mortality were greater than ever before; and the enlargement of the lymphatic glands, which has attached to plague the epithet Bubonic, was very slight or altogether absent in a very much larger proportion of cases. These were general impressions. The hospital statistics found elsewhere give actual facts.

The following notes have been prepared by Mr. C. Carkeet James, Drainage Engineer, on the Plague Charts compiled by him from August 1896 to the end of the third Epidemic in May 1899. The two charts are given as an appendix to this report:—

“The third Epidemic of Plague having run its course, it is possible to now make a comparison of the Charts which shew the progress of the three epidemics. These charts have been previously described in detail, in the Plague reports of Major-General Sir W. F. Gatacre and Sir J. M. Campbell, but it will not be out of place to again give a brief explanatory description of them here under their different headings.

#### CHART No. 1.

Chart No. 1 shows the mortality from all causes which occurred in the City of Bombay from August 1st, 1896, to June 30th, 1899, registered concurrently with the following data:—

Maximum temperature	...	}	Indicated on the Chart by thick black lines.		
Minimum	“				
Population	...	“	“	“	by a thin blue line.
Humidity	...	“	“	“	by a green line.
Daily mortality	...	“	“	“	by a thick red line.
Normal mortality, previous five years' averages	...	“	“	“	a thin red line.
Velocity of wind	...	“	“	“	a purple line.
Clouds	...	“	“	“	a brown line.



The horizontal scale is six days to one inch ; the vertical scale varies as shown in the left hand margin. The information compiled in this chart has been obtained as follows :—

The maximum and minimum temperatures, humidity, velocity of wind, and amount of clouds have been obtained from the published records of the Colaba Observatory. The population has been obtained from the Managing Director of the Tramway Company, who has based his returns on the averages of Tramway receipts, extending over several years. These returns have been checked with the information supplied by the Collector of Bombay, and as they agree within a few thousands, they may therefore be taken as substantially correct. The daily mortality, from the Cemetery returns of the Municipal Health Department. The normal mortality, the average of five previous years from the returns published in the *Government Gazette*. The red figures at the top of the Chart are the total deaths from all causes for the month, and the red figures at the bottom of the chart are the total deaths from Plague.

The total number of deaths from Plague has been arrived at in the following manner :—

The total weekly average number of deaths, during the five years previous to the Plague, has been deducted from the total deaths from all causes for the week, and the remainder taken as the number of deaths due to Plague, deaths from Cholera being shown separately, but owing to the decrease of population, there must be added, in order to arrive at a true conception of the increased mortality a figure bearing the same proportion to the recorded deaths as the calculated actual population bears to the normal population of 8,50,000. This calculation has been made, and the figure or number to be added is given in red figures above the numbers for estimated deaths from Plague by months, entered at the bottom of the Chart.

The object of the compilation of this Chart was to establish the truth or otherwise of some of the theories freely advanced regarding the definite influence of temperature, humidity, wind and clouds on mortality. Northerly and Easterly winds, which are always dry, seem generally to have had an unfavourable influence, often, immediately so, on the mortality, *e.g.*, from November to near the end of March when the humidity is generally between 60 and 70, and while Easterly winds prevail the mortality increases irregularly, but more or less steadily ; and in particular cases, *e.g.*, on the 8th and 9th February 1898 and on the 2nd March 1898, when high winds were accompanied by a fall in the Humidity, there were immediate increases in the deaths, as shown in the Chart.

There has not, however, been a sufficiently consistent sequence to make any generalisation possible. As a matter of fact, in order to have given the elements a fair chance, all Plague measures would have to be abandoned, for it cannot be doubted that the measures that have been adopted in Bombay have had the effect of diminishing the extent of the pest. The degree of sanitary efficiency is also a disturbing factor.

It would appear that a low temperature may have had an adverse bearing on the disease, as, throughout the months of December, January and February, when the minimum temperature is the lowest for the year, the mortality is greatest.

The chart is interesting in showing the movements of the population. In the first epidemic the population fell from 8,50,000 to 4,37,000 in the middle of February 1897. In the second epidemic the lowest recorded population is 7,10,000, about



March 15th. In the third epidemic the population was estimated to be 7,37,000 in the middle of April, having fallen from 9,50,000, showing that the fear of Plague has considerably decreased, since the first epidemic. Another interesting point is the total number of deaths registered from all causes shown on this Chart from August 1st, 1896, to June 30th, 1899—35 months—which amount to 1,56,980. The number of deaths based on an average of 5 years before that period is 83,764, leaving an excess of 73,216 as the probable number of victims of Plague. Taking 8,50,000 as the average population, this figure means that the percentage of loss from plague is 8·61 only, a remarkable result when compared with recorded epidemics in earlier years.

The fixing of a date for the commencement of Plague in Bombay must always be problematical, but from facts gained from enquiries made during the first epidemic from local medical practitioners, the first week in August 1896 was agreed upon by the Bombay Plague Committee, certainly from about that date the total mortality rose above normal, and never again touched it except on one or two days until the middle of April 1897.

In referring to the Chart it will be noticed that after the first epidemic the mortality reached its normal level about the middle of April, and remained so until nearly the middle of July. This occurred again in the Spring of 1898, except that the normal level was reached at the end of the first week in May, and the mortality remained so to the middle of August.

It might be said that the lowering of the sub-soil water due to evaporation had something to do with this result, but it must be remembered that however low a level the sub-soil water reached at the end of May, it was fully replenished before the end of June by the first monsoon rains.

From the middle of July 1897, the health of the City suddenly took a turn for the worse, and throughout to the remainder of the monsoon, the mortality was abnormally high, showing the probable presence of plague, until it became epidemic in December 1897. But in referring to the same period in 1898-99, there is a very distinct improvement, and, with the exception of the period from the end of August to the middle of October, the death-rate of the City is normal, and in spite of the fact that the population was much in excess of 8,50,000. This cannot be accounted for by any particular meteorological conditions, but I think it may probably be placed to the credit of the good work done in putting the City in a better sanitary condition.

#### CHART No. 2.

Chart No. 2 shews the course of the epidemics for the three seasons 1896-97, 1897-98, 1898-99, plotted per mille per annum according to the official returns of the weekly death-rate from all causes against actual population. In this as in Chart No. 1, the population has been estimated from the Tramway Company's statistics, checked with the returns supplied by the Collector of Bombay.

The red line shows the epidemic in 1896-97, the blue line the epidemic in 1897-98, and the black line the epidemic in 1898-99, and the yellow line the normal death-rate based on the average of five years previous to 1896. It is only by a chart of this description that a true comparison of the three epidemics can be made. An epidemic is considered to be present when the mortality of the City is equal to 60·00 per mille, that is about double the normal. The following are a few interesting points which the Chart brings out :—

The first epidemic was undoubtedly the worst ; it commenced in the first week in December and ended in the last week in April, and its maximum was attained in February with a death-rate of 225 per thousand on a population of 442,000 ; from

that time it steadily declined until the end of April. For these five months the total number of deaths from all causes was 31,618 including 23,256 deaths over the normal number, which, in the absence of any other cause, may be taken as the plague mortality.

In the second epidemic the mortality did not reach epidemic proportions until the beginning of January 1898, and it attained its maximum of 165·00 per thousand in the third week in March on a population of 715,400, having taken a fortnight longer to reach it than in the first, and declining, as did its predecessor, at the end of April. The total number of deaths from all causes for the four months of this epidemic was 29,509, and of which 18,651 are over the normal and may be accounted plague deaths.

The third epidemic started at the end of the first week in January, just a week after its predecessor. It has followed the curve of the second visitation almost exactly, attaining its maximum death-rate of 161·5 per thousand in the same week on a population of 774,500 souls. The length of this epidemic was five months, for it did not decline, as did the previous ones, at the end of April, but a month later, and the total number of deaths from all causes was 34,241, being 22,859 over the normal.

The Chart distinctly shows that the third epidemic, though not so virulent as the first, and not attaining such a high death-rate by 3·5 per mille as the second, was considerably worse than the second in its length, and in its total number of deaths. It also shows that the generally accepted idea that plague leaves us with the advent of the hot weather, is not borne out in the third epidemic, which ran practically until the end of May, and the fact that a large proportion of the population sleep out of doors in the hot weather is not such an important factor as is supposed.

Another point in the Chart worth noticing is that all three epidemics have as nearly as possible commenced three months after the end of the monsoon. In 1896, the epidemic started in the first week in December, the rains of that year having ended in the first week in September; in 1897 and 1898, the completion of the monsoon occurred about the first week in October, and the second and third epidemics started as nearly as possible at the end of December and the first week in January.

### General Observations.

In reviewing the two Charts now completed for the three epidemics, it is interesting to note some of the points which stand prominently out in them, and which, if not altogether definite, are yet valuable.

It may be noted from Chart No. 1, that a low temperature in all three epidemics has had the effect of increasing the disease, and that dry Northerly and Easterly winds clearly have an unfavourable influence, often immediately, on the mortality.

The coincidence mentioned under the notes on Chart No. 2, that plague becomes epidemic three months after the completion of the monsoon, tend rather to point that a period of time elapses either of immunity for the population or of dormancy for the plague bacilli.

Each year the disease appears to become epidemic at a later period than its predecessor, and it will be interesting to note, should there be a fourth epidemic, whether there is anything in the coincidence of the mortality becoming epidemic three months after the monsoon is over.

It cannot be doubted that the measures undertaken in Bombay to combat the plague have been remarkably successful, and that only 8·61 per cent. of the population should have in three years succumbed to the disease is a result which has probably never been hitherto obtained in the history of the plague. But in working out the percentage of plague mortality for the three epidemics on *actual estimated population* from Chart No. 2, we get the following :—

No. 1	Epidemic	4·30
No. 2	„	2·43
No. 3	„	2·80

These figures are even more remarkable than the figure 8·61 on the assumed population of 850,000 for the whole period.

In regard to the concluding paragraph of the above, it should be pointed out that the figures are based upon chart No. 2, which only deals with the epidemic months proper. To arrive at a true conception of the damage done by plague, not only the plague mortality during the monsoon recrudescences, but all plague deaths throughout the year should be taken into consideration. The table given at the beginning of this chapter compares the mortality of the past three years with the average and shows that—

In the first year the mortality was 37·70 per mille above the average.

„ second	„	„	38·96	„	„	„
„ third	„	„	33·51	„	„	„

This would make the percentage plague mortality for the three years—

First year	3·77
Second year	3·89
Third year	3·35



## CHAPTER III.

### Measures adopted.

**The discovery  
of Plague  
cases.**

The discovery of plague cases is the basis of all plague administration. The measures adopted may be perfect, but if a large proportion of cases escape detection the administration is a failure. For various reasons it was not thought feasible to render the report of all sickness, or of all sickness from plague, compulsory upon the public generally in Bombay. But the majority of plague cases were discovered through the following agencies :—

1. Reports from volunteers.
2. Voluntary admissions into hospital.
3. Information from friends and neighbours.
4. Information from private practitioners.
5. Information from the Military Authorities.
6. Roadside cases and miscellaneous.
7. Information secured by the Plague Staff direct, or from Police or Municipal Subordinates.
8. Information from cemeteries.

The following statement shows for A Ward, B Ward South, C Ward and D Ward the extent to which these various agencies proved useful. The figures for D Ward are practically for the whole year ; those for the other districts do not go back to the beginning of the year : the record for B Ward South commences in August 1898 and for C Ward in November 1898 ; for A Ward about the same time :—

	A Ward.	B Ward South.	C Ward.	D Ward.
Volunteers ... ..	487	350	1,233	376
Voluntary admissions ... ..	222	326	576	295
Friends and neighbours ... ..	121	119	99	134
Private practitioners other than volunteers..	42	37	79	6
Military ... ..	91	...	...	...
Plague, Police and Municipal Staff, Roadside and Miscellaneous ... ..	421	317	405	908
Cemeteries ... ..	112	155	201	286
Total...	1,496	1,304	2,593	2,005

It will be seen that the volunteers in C Ward reported 47 per cent. of the cases discovered, in A Ward 33 per cent., in B Ward South 27 per cent., and in D Ward 19 per cent. Of other districts their assistance was specially valuable in E Ward West and parts of F and G Wards, but the very large area comprised in these last two Wards had hardly sufficient volunteers. In the Central District out of 903 *attacks*, 554 were reported by volunteers and 249 were either reported by relatives or voluntarily admitted into hospital. The highest proportion of voluntary admissions to hospital was 25 per cent. in B Ward South, C Ward came next with

22 per cent., and A and D Wards following with about 15 per cent. in each case. In other districts the proportion was much smaller; it was to a very large extent the well-to-do classes with private hospitals of their own who most readily went to these institutions, and these classes are much more numerous in A, B, C and D Wards than in the northern parts of the city. The voluntary removal of patients to hospital is highly desirable from many points of view, but as information of them was not, as a rule, given to the District Officer concerned till after arrival of the patient in hospital, he constantly found that the residence of the patient was in such cases entirely deserted, and it was therefore often impossible for him to satisfy himself that the kit in the infected rooms was properly disinfected. Friends and neighbours gave but little information—the highest proportions being in B Ward South 9 per cent. and in A Ward 8 per cent. The class of persons who are bound by law to give information of any plague case that they may become cognisant of in a dwelling, *viz.*, medical practitioners, gave least assistance of all. It should, however, be remembered that a number of the most prominent medical practitioners in Bombay were members of various Volunteer Committees, and reported a large number of cases in that capacity. Thus in A Ward against 42 reported by private practitioners in their ordinary practice, 82 were reported by the 3 medical men who were working as volunteers. In a certain number of cases it was found necessary to call upon professional gentlemen for an explanation of their apparent failure to report plague cases that they came across in their practice, but the difficulties of diagnosis are often admittedly great, and though in many cases there was little real doubt it was generally impossible to prove in these cases that they were aware of the nature of the disease. Two cases were, however, taken into court—in one the doctor concerned made an official apology and the complaint was withdrawn, in the other the accused was convicted and fined. In three other cases the medical practitioners admitted their failure to comply with the law, and as they expressed regret and promised amendment they were not prosecuted. Difficulty was often experienced in dealing with plague cases in consequence of the delay which occurred in the submission of their reports by medical men, or the insufficiency of the addresses given. The profession complained bitterly that they were handicapped in this matter, that owing to their compliance with their legal obligations they lost a great portion of their practice, and that quacks and native *vaid*s drove a roaring trade, treating and concealing plague cases without let or hindrance. Some doubt was felt as to whether an unqualified man could be regarded as a medical practitioner within the meaning of the law, but this has been set at rest by a recent prosecution ending in the conviction of a *vaid* who had failed to report a case. Men of this class, however, cannot be expected to have much professional pride, and it is a simple matter for them to say that they were ignorant of the nature of the disease. The following is an instance in point. A case was found by the Plague Staff, and unhesitatingly diagnosed as plague by two fully qualified and most experienced medical men. It was under the treat-



ment of a Hakim, who continued to attend the case after its removal to hospital. On being called upon for an explanation of his failure to report the case he wrote as follows :—

“The plague according to our Unani medical practitioners is attended with high fever, delirium and sometimes total insensibility. One of the highest authorities of our medical system, Don Henri de Matteis, late physician to the late Begum of Bhopal, assigns the above symptoms to the plague in his work.”

He then proceeds with an admirable air of indignation to maintain that his patient had none of these symptoms, and to challenge denial of his statement. His position was impregnable.

The information supplied by the Military refers entirely to those portions of A Ward where their co-operation was enlisted, and the District Officer speaks very highly of the efficient manner in which they searched out every case of plague occurring in those limits.

The figures show how heavily the work of searching out plague cases fell upon the staff in D Ward. A certain number of the cases were roadside. The discovery of the remainder was due partly to the cordial relations which many of the sectional Medical Officers managed to establish with the residents in their charges, partly to the careful inspection of infected and insanitary localities, and partly to the information picked up by the subordinates of various public departments in the course of their daily duties. In the earlier part of the year a certain amount of money was in some parts of the city paid to people who brought news of plague cases, but this system is open to abuse and was almost entirely discontinued. Here and there landlords and their agents were induced to keep the Plague Staff notified of any cases that might occur in their chawls, but as a rule the dread of evacuation with the possible loss of rent involved inclined them to keep any sickness secret. Information obtained from the cemeteries was in one sense most unsatisfactory and in another supremely important. As evidence that an individual from a certain house had died of plague it was entirely unreliable, for except in the few cases when a medical certificate is forthcoming the cemetery establishment is entirely dependent upon the account given by members of the funeral party as to the cause of death and for the address where the deceased had expired. Usually the one object of the funeral party was to satisfy the cemetery officers that death was not due to plague, and through ignorance or intention they constantly gave incorrect addresses. The supreme importance of information from the cemeteries lies in the fact that the major portion of plague cases terminate fatally, those that linger long enough to recover are usually brought to light sooner or later in their residences, those that succumb are invariably included in the returns from one cemetery or the other. It is a fairly safe conclusion that all plague cases not otherwise discovered are included, if not identified, in the daily death returns.



Every day the returns of deaths from the various cemeteries are sorted out in the Health Office, according to the districts in which the deceased resided; it will, however, be apparent that it was not sufficient for the Plague Staff merely to pick out the plague cases and visit and deal with the houses named. The hospital assistant or other official at the cemetery is not invariably a man whose diagnosis could be entirely relied upon even if he had had every opportunity of treating and watching the course of the disease while the patient still lived; his difficulties in arriving at a correct conclusion are practically insurmountable when he has to rely upon the statements of persons generally ignorant, and almost always free from the rudiments of medical knowledge, whose intelligence moreover is devoted towards creating the belief that the death has been due to any other cause but plague. In short the diagnosis of the disease at the cemetery cannot be trusted, nor in times of plague can the addresses from which bodies are brought as supplied from the cemeteries be relied upon. Here again the cemetery officials are entirely dependent upon the information supplied by members of the funeral party. Often in pure ignorance, oftener with the deliberate object of evading the plague administration, they give entirely wrong addresses, and at the beginning of the present year the percentage of deaths which the administration were unable to trace in the city from the information supplied by the cemeteries was about 20.

To meet these difficulties two measures were introduced. The sectional Medical Officers employed in the city were held responsible to visit every house where a death occurred and by the strictest possible enquiry ascertain whether there was any suspicion that the death was due to plague; if there was, disinfection and such other measures as were deemed necessary were adopted. At the same time to facilitate their discovery of the houses where deaths had occurred the services of the police were enlisted: and in this matter the co-operation of Mr. R. H. Vincent, C. I. E., late Police Commissioner, was of very great value. Seventeen recording stations were constituted in different parts of the city, to each of which two superior police officers were attached for day and night duty. The police in the city had instructions to note all deaths that might occur and to report them without delay at the nearest recording station; the information was then noted down by the Recording Officer and arrangements were made to pass it on without delay to the District Officer concerned. This system was introduced towards the end of August, when the increasing mortality gave grave cause for anxiety. It worked well at the outset, but it did not overcome the desire of the people to conceal the address where a man had died of plague; they were clever enough to evade the police in many cases, and the sepoys themselves, who had little inducement to show smartness in this extra and alien duty, soon showed a tendency to become slack, and as regards deaths which they failed to register the difficulties of the Plague Staff were just as bad as before. The proportion of deaths untraceable had fallen from 20 to 10 per cent., but with a rising mortality in January, and every pro-

spect of a severe epidemic, it was felt that something must be done to further improve matters. The weak points of the system then in operation have been indicated above and the lines along which improvement might be looked for were clear. The police required to be stimulated, and the people had in some way to be induced to give information themselves. After much consideration the following scheme was introduced :—Every policeman on duty in the City was provided with a small book of tickets in foil and counterfoil ; whenever he heard of a death in his beat he was to verify the address and offer a ticket to a member of the funeral party ; and at the time of reporting the matter the Recording Officer was to initial the counterfoil in token of the information having been registered and passed on to the District Officer. For every ticket issued the constable was to get annas 2. The Officers on duty at the various cemeteries were at the same time instructed to ask for the ticket whenever a body was brought for disposal, unless a certificate from a volunteer or some other satisfactory document indicating the address was forthcoming, and at the principal cemeteries a small staff of messengers was organised under the supervision of a few reliable men who were to return with the funeral party and verify the address in every case where a ticket or other satisfactory certificate was not forthcoming. This scheme, thanks to the co-operation of the Commissioner of Police, Mr. H. Kennedy, was introduced at the beginning of February. The people readily fell in with the idea of obtaining tickets from the police and the work of the police considerably improved. The people in the few cases when they came to the cemeteries unprovided with the necessary ticket or certificate made no difficulty about taking a messenger back with them to indicate the house from which they came, and the number of untraceable deaths fell from about 10 to about 6 or 7 per cent.

This system might have continued to work satisfactorily, but on the one hand the reward of two annas was not a very great one to the man, though it might amount up to considerable sum for the Municipality to pay. One case came to notice where a policeman issued a ticket to a relation (whose wife died of *plague*) without registering the address. He lost 2 annas for the ticket, but his object was to save his friends any trouble in the way of disinfection, &c., and it was only by chance that the District Officer found out the circumstances. The Police also had other duties to perform ; and while for one reason or another they missed a few deaths or gave wrong addresses in a certain number of cases, it was impossible to hold such failure to be a dereliction of duty or to demand their punishment. On the other hand the work was alien to their proper duties which occasionally suffered in consequence of the registration work, and the Police Commissioner not unnaturally, as soon as the mortality approached the normal, pressed that his men might be relieved of all connection with death registration. The system was also somewhat cumbrous inasmuch as the police force as a body are not able to read and write, and while the interposition of Recording Officers was



necessary between them and the District Officer, it was not found possible to devise any form of ticket which would indicate to the cemetery authorities the locality from which a body was brought; an incorrect or false address might still be given them by the funeral party, and the unfortunate sectional medical officer in some other part of the city might upon the information from the cemetery trudge all over his section in search of a death, which had already been registered by the police in the section to which it properly belonged, and had already been traced and dealt with by the medical officer there.

A further scheme has, therefore, been recently introduced. The assistance of the police has been dispensed with and a body of some 200 registration ramoses has been engaged. They have been assigned beats throughout the city, and one man is always on duty on every beat. They can all read and write, and instead of merely tickets they issue to the funeral parties certificates showing from what house they come, so that there is little room for mistake at the cemeteries. The men are directly under the control of the various district officers, who should have no difficulty in keeping them up to the mark; and as they write the certificates themselves in foil and counterfoil the necessity for recording officers disappears. The scheme is in its infancy, and it has not been possible to exercise much selection in gathering this uniformed corps of ramoses, but if it is carefully worked there is every reason to hope it will prove successful. In connection with this subject Rao Bahadur Narayen Trimbak Vaidya rendered special and very valuable assistance.

By the above means the proportion of undiscovered plague cases has been considerably reduced. There were of course a number of cases where the enquiries of the sectional medical officers could elicit no satisfactory information as to the cause of death. The relatives would vehemently deny that it was plague, but the rapidity of the disease, the symptoms described or other circumstances often left the sectional medical officer in grave doubt. Such cases were classed and dealt with as suspicious, and though, except in one or two cases, the measures of segregation of the family or vacation of the house were not adopted, disinfection was in all but a few instances rigorously carried out in suspicious cases. In the central district where the discovery of plague presents more difficulty than anywhere else in Bombay, the treatment of suspicious deaths received special attention from Sirdar Mahomed Yakub. He pointed out to the principal Jamayets the necessity of strict enquiry into the cause of death, and they agreed that unless a medical certificate was forthcoming, or sickness reported beforehand and the patient examined before death by the sectional medical officer, or unless there was clear and undeniable proof of the cause of death, the accounts of friends and relatives should not be accepted, but the death should be treated as suspicious. At first frequent objection was taken to the disinfection which followed this classification of a death, but the support of the Jamayets and the assistance of the headmen gradually led to its being



accepted without much demur. Houses where such deaths occurred were watched, lists of the inmates were made, and surprise visits were paid by a lady nurse with volunteers, and if a plague case or a second suspicious death occurred the inmates were induced to go into a segregation camp or some other suitable house.

The following statement shows, Ward by Ward, the total mortality the number of plague and suspicious deaths and the average mortality, and is an index to the extent to which the staff was able by the various agencies at its disposal to find the plague cases that occurred:—

Ward.	Total Mor- tality.	Plague Deaths.	Suspicious Deaths.	Total of Cols. 3 & 4.	Balance due to ordinary causes.	Average.
1	2	3	4	5	6	7
A ... ..	2,973	1,103	113	1,216	1,757	1,578
B ... ..	10,942	2,572	1,081	3,653	7,289	6,002
C ... ..	11,540	3,369	686	4,055	7,485	6,450
D ... ..	5,069	1,826	334	2,160	2,909	2,466
E ... ..	15,630	4,454	994	5,448	10,182	6,669
F and G ...	8,220	2,250	943	3,193	5,027	2,999
Water Division ...	61	8	...	8	53	70
Non-resident and un- known ... ..	892	225	...	225	667	615
Total ...	55,327	15,807	4,151	19,958	35,369	26,849

The above average is taken on a population of 8,50,000. The recorded plague deaths in the year ending 31st May 1897 and 31st May 1898 were 11,683 and 16,554. The following table compares the results of the 3 years :—

Year.	Total Mor- tality.	Plague Deaths.	Suspicious Deaths	Total of Cols. 3 & 4.	Balance due to ordi- nary causes	Average population.	Average deaths on basis of 31·58 per mille.	Undetected plague cases. Cols. 6 to 8.
1	2	3	4	5	6	7	8	9
1896-97	48,496	11,683	...	11,683	36,813	7,00,000	22,106	14,707
1897-98	53,727	16,554	...	16,554	39,173	7,90,000	24,948	14,225
1898-99	55,327	15,807	4,151	19,958	35,369	8,50,000	26,849	8,520

Considerable improvement has been effected, but there is room for a great deal more.

Removal of  
patients to  
Hospital.

As a general rule every suffering plague case was removed to hospital, a not inconsiderable proportion going voluntarily before the District Officer appeared on the scene, but there were some 900 cases left in their houses. Of these approximately 150 were cases that might have been removed, but which the District Officer in the exercise of the discretion vested in him permitted to be isolated at home. Of the remainder between 50 and 100 were Health Department biggaries who were dealt with by the Health Department only, and the rest were moribund cases. In the moribund cases death supervened usually in a few hours and the ordi-

nary measures of disinfection and segregation were then adopted. Cases were only isolated where it was possible to secure for the patient a room of decent size with good ventilation. Endeavours were made to secure attention to a few essential matters. The number of attendants was limited to two, disinfectants were supplied and the relatives directed how to use them ; special instructions being given as to the disinfection and removal of all secretions and excretions of the patient. The rest of the house was, if possible, evacuated and visits from friends and neighbours discouraged. The house was frequently visited by the District Officer, Sectional Medical Officer or volunteers, to see that these precautions were adopted, but though the people were ready enough with promises, it was impossible to rely upon their performance. The number of cases where the isolation of patients was attended with disastrous consequences was not very great. Lt. Brackenbury quotes two cases of a little boy and of a servant who had been tending isolated cases dying of plague a few days later. In two cases, in B Ward North, the infection spread to the next floor and there attacked several rooms, and Captain Cuppage quotes the following case :—

“ On 27th August a death occurred in this house from plague. Subsequently there was another death from the same cause. On 2nd September the Medical Officer was called in to see two people sick in the same house. He pronounced them to be suffering from pneumonic plague. Not being in a fit condition for removal they were allowed to remain in the house. Two of the attendants in these cases died subsequently elsewhere of plague. All these people were members of one firm and related to each other. No dead rats had been found in the house.”

**Segregation of contacts.** The word “contact” is used to describe persons living with or attending a person suffering from plague ; and endeavours were made to remove such persons, partly to get them away from the infected room, and partly to reduce the danger of their infecting others. Ordinarily contacts were sent to the accommodation provided at the various hospitals, public and private, for the friends and relatives of patients, but where the plague patient had died before removal they were sent to one of the Municipal Health Camps. Contacts were often very difficult to get hold of ; to avoid going to camp they would leave the house where they had been living and find quarters elsewhere. A large number who did this were followed up, found, and sent to camp, but it cannot be denied that a great many people coming under the description of contacts managed to escape being sent to camp. Another difficulty in regard to them was that the discipline of *private* hospitals was hardly sufficiently good to secure that contacts sent to them would reside there. If the patient lived there was no trouble ; if he died even a few hours after admission there was practically no control over the contacts, and they could leave the hospital and take up quarters wherever they wished. Endeavours were made to improve matters in this respect, but without much success ; the managers of various private hospitals were called together, but they pointed out that it would be impossible to do much in this direction without making the hospitals unpopular. But though the segregation



of contacts may not have been carried out so thoroughly as was desirable, the figures show that a good deal of work was done. A great many more of those who were not dealt with by the Plague Staff, went into the private camps and hutments of their own accord, and it may be hoped that the work that was done went far to prevent the spread of infection. The difficulties in the way of finding and sending contacts to camp were greatly diminished by the assistance rendered from the discretionary relief fund to those whose livelihood was interfered with. In E Ward inoculation was to a large extent offered to contacts as an alternative to going to camp; and was often preferred, more especially in Tarwari, a section that has long been in honorary charge of Mr. Lund. In B Ward South the segregation of contacts was especially unpopular, and when information of a plague case was duly given, and the patient sent to hospital, the contacts were not pressed to vacate their houses except while they were being disinfected.

The District Officer, B Ward South, found that the removal of contacts to camp was the principal cause of the concealment of cases and rendered nugatory the efforts of the volunteers. In view of the fact that, if a plague case is reported and removed in its earliest stages, the danger to friends and neighbours is minimised, and in order to meet so far as possible the objections of his people and thereby secure better information about plague; he was permitted to issue the following circular. It explains itself:—

“When you hear of any illness, especially fever, in your house go and report it *at once* to the District Plague Office in Argyle Road. A Doctor will be sent to examine the case. If it is plague the patient should *at once* be sent to hospital where he will be well looked after and have a much better chance of recovering than if kept in the house. He will be allowed to go to any hospital he may choose. One or two attendants will be allowed to accompany him. His relations will be allowed to visit him. The remainder of the people living in the same room with the patient will be requested to remove into another room while it is being disinfected and cleaned. If it is not plague, the Doctor will record it and give a certificate (if asked for) and in the event of death the authorities will know that it was not due to plague and there will be no trouble. But there will be trouble if the authorities having heard of a death due to an illness that has not been reported to them, get to know or suspect that the person died of plague. In that case those people living in the same room, as the deceased, will be liable to be sent to quarantine for 10 days. The reason for this being that people living in close contact with a plague-stricken man for three or four days are liable to become attacked themselves and if allowed to go where they like, may carry the disease into other houses and endanger the lives of many other healthy people. Whereas if a plague stricken man is *at once* removed from a house, there is little chance of the disease spreading in that house. In very special cases and then only with the sanction of the District Plague Officer patients may be treated in their own houses.”

**Evacuation of  
infected houses  
and localities.**

The evacuation of thoroughly infected houses, was carried on systematically throughout the city. It is a measure which popular opinion approves, and often the mere suggestion to the residents of a chawl that it was better for them to go into camp for a bit was enough to set them



packing up their property preparatory to moving. The question whether a house was infected or not was entirely one of evidence, and the District Officer had to decide each case on its merits. Thus 5 cases at short intervals in a house containing 50 or 100 people would show that continued residence there involved great danger to their lives, but if the population was 1,000, or there was a considerable interval between the cases, the same inference could not so confidently be drawn. A good deal more trouble was experienced with Mahomedans than with Hindus in carrying out this measure; and difficulties were often made by landlords, who foresaw a loss of rent, when the tenants were willing and ready to go. But with the assistance of volunteers, who explained to the people the dangers of continuing to live in an infected house, the District Officer could almost invariably get the people to leave. The cost of moving was paid from the discretionary relief fund, and considerable sums were spent in assisting those whose daily work was interfered with, and this went far to smooth away difficulties. How the people were dealt with after they were moved is described in the chapter on "Camps." It is difficult to give any clear idea of the nature of this work; the figures convey but little; but it was common in the city during the epidemic to see a street almost blocked up with carts, hurriedly collected from all directions, loaded up with furniture and kit of every description: the men busily carrying boxes and bundles out of the chawl to the carts, the women and children sitting on the top of everything, the District Officer standing by listening to and smoothing away difficulties, with the relief fund in his pocket, and directing and arranging the whole operation. A few extracts are given from reports showing the nature of the work done.

"I, this morning, vacated the whole of Bhangwadi, 175 people and 33 cart-loads of kit. I entrusted the carrying out of this work to Mr. Parshotam Udhawji, Chairman of the Local Committee. I would like to draw your attention to the great assistance and excellent work involved; a great deal of worry and trouble has been taken by him and his Committee."

In this case the people heard overnight that they were to be removed, and attempted to migrate during the night. As the locality was badly infected, this would have been fatal. Mr. Parshotam heard of this, and promptly was on the spot; he communicated with the police and obtained ready assistance from Superintendent Haek and the move was prevented, some 14 people did go away but were found and sent to camp the following day.

Another day Lt. Warneford wrote:—

"I, this morning, from 6 a.m. to 11 a.m., vacated 5 chawls in Limachiwadi and sent 141 people to the Goculdas Camp and (about) 277 people to the Charni Road Camp, making a total of 418 people in all. These chawls have an old plague record, are dirty and badly overcrowded; on 26-12-98 one plague case occurred there and on 31-12-98, I personally removed 3 plague cases in one morning from there, so I have now completely vacated the place. The Goculdas and Charni Road Camps are both again completely full up."

Here is another extract :—

“Yesterday, from 6 a.m. to 1 p.m., I vacated the chawls in the interior of Antobawadi and removed 466 people from them, of whom 240 were sent to the Kennedy Sea Face Camp, and 226 to the Goculdas Tejpal Camp. This interior of Antobawadi has an old plague history in previous epidemics, in September and October of this year also plague broke out in it and there occurred 9 cases, 2 deaths and 2 suspicious deaths of plague in it. Again within the last week 2 cases of plague were removed on the 16th December and 2 cases on the 20th December. I propose to allow re-occupation after 15 days.”

Another, dated 11th January 1899, is as follows :—

“I, this morning, vacated 6 chawls in Carnac Cross Road, in which 2 cases of plague and 1 death, suspicious of plague, had occurred last week. I sent the occupants to Crawford Market Camp. 178 persons were counted into the Camp up to 10 a.m., but there are probably 30 or 40 more to come in. Lt. Anderson, Dr. Britto and Rao Sahib G. N. Nadkarni and his Committee were present and assisted in the vacation.”

In F and G Wards houses where there had been cases the previous year were, in a good many instances, evacuated in the year under report before a case occurred, directly a dead rat was found. Thus at Sion, Koliwada, Agriwada and Bhandarwada some dead rats were found in houses where there had been cases the previous year, and immediately with the assistance of Mr. A. N. Dalvi the whole place was vacated, and no plague cases occurred. Similarly the villages of Bhoiwada, Naigaum, Sevri Koliwada, Worli Koliwada, and Mori Road were evacuated on the occurrence of the first case or as soon as dead rats were found. The people were glad to go out, quite early in the year, and did not return until they were driven in by the rain. No force had ever to be used on these occasions, but the assistance of the police was occasionally asked for and half a dozen constables were sufficient to maintain order, to prevent pilfering, and to see that none of the evicts bolted to other parts of the City. Where the people had suffered severely in the previous year and had been turned out with immense difficulty, it was found during the year under report that they were quite ready to go as soon as plague declared itself. The instances from F and G Wards given above are illustrations, and another example was found in the fishermen of Mazagaum Koliwada, who undoubtedly were saved from a loss of many lives by their ready compliance with the advice given them.

The following statement shows, district by district and section by section, the amount of work done in the direction of removal of the sick and the removal of contacts and evicts to Camp from the week ending



15th October 1898 to the week ending 27th May 1899. Accurate figures in this form for the period prior to this are not available :—

SECTION.	Population by Census of 1891.	No. of Plague Cases discovered.			No. of Patients removed to Hospitals.	No. of Persons sent to Hospitals or Camps as Contacts.	No. of persons segregated in private Quarters other than authorized Hospital or Camp.		No. of Persons sent to Camps as Expts.	REMARKS.
		Attacks.	Deaths.	Total.			Patients.	Contacts.		
1	2	3	4	5	6	7	8	9	10	11
<b>A—</b>										
Upper Colaba ...	4,335	38	16	54	37	65	1	17	176	
Middle & Lower Colaba	13,622	309	213	522	276	580	33	205	2,005	
Fort Southern ...	3,951	40	7	47	40	33	...	...	55	
Fort Northern ...	32,487	473	118	591	445	794	28	142	2,300	
Esplanade ...	10,064	68	34	102	55	36	13	30	40	
		928	388	1,316	853	1,568	75	394	4,576	
<b>B—South—</b>										
Mandvi ...	37,295	508	222	730	485*	556	51	19	755	* Out of these 28 cases were of suspicious type.
Chukla (Portion) ...	21,465	160	102	262	158*	184	7	6	135	* Out of these 5 cases were of suspicious type.
		668	324	992	643*	740	58	25	890	* Vide remarks above.
<b>B—North—</b>										
Umarkhady (Portion)...	13,117	245	68	313	232	179	13	16	1,957	
Dongri ...	30,317	350	387	737	342*	313	18	18	2,768	* Out of these 10 cases were of suspicious type.
		595	455	1,050	574*	492	31	34	4,725	* Vide remark above.
<b>C—</b>										
Market ...	44,751	537	291	828	570	132	17	31	2,848	
Dhobi Talao ...	39,945	271	282	553	265	1,198	6	2	1,407	
Fanaswadi ...	24,069	270	273	543	270	765	...	...	1,529	
Bhuleshwar (Portion) ..	23,351	281	109	390	280	473	1	...	73	
Kumbharwada ...	32,209	443	365	808	412	678	31	...	1,606	
		1,852	1,320	3,172	1,797	3,246	55	33	7,463	
<b>D—</b>										
Khetwadi ...	28,814	298	211	509	295	385	3	7	376	
Chowpatti ...	26,999	271	274	545	279	534	2	8	922	
Wakleshwar ...	11,512	135	101	236	133	254	2	6	92	
Mahaluxmi ...	12,990	121	81	202	119	149	2	366	156	
	17,014	306	203	409	203*	246	4	8	244	* Out of these 1 case was of suspicious type.
		1,041	870	1,911	1,029*	1,518	13	395	1,790	* Vide remark above.
<b>E—West—</b>										
Kamathipura ...	29,293	361	387	748	396*	1,792	26	24	4,497	* Out of these 56 cases were of Relapsing fever and 5 were of suspicious type.
Tardeo ...	18,980	369	282	651	388*	1,542	9	5	4,671	* Out of these 24 cases were of Relapsing fever and 4 were of suspicious type.
1st Nagpada ...	11,133	114	136	250	133*	271	3	4	612	* Out of these 12 cases were of Relapsing fever and 10 were of suspicious type.
		844	805	1,649	917*	3,605	38	33	9,780	* Vide remarks above.
<b>E—East Byculla—</b>										
Byculla (Portion) ...	31,602	592	933	1,525	462*	1,796	132	240	8,042	* Out of these 2 cases were of suspicious type.
		592	933	1,525	462*	1,796	132	240	8,042	* Vide remark above.
<b>E—East Wari Bunder—</b>										
Mazagaon ...	33,640	387	190	577	300	486	87	276	2,433	
Tarwari ...	21,298	486	283	769	361	1,038	125	465	3,193	
		873	473	1,296	661	1,524	212	741	5,626	
<b>F and G—</b>										
Parel ...	28,740	323	656	979	314	407	9	333	1,376	
Sewri ...	6,063	115	271	386	110*	205	6	30	2,760	* Out of these 1 case was of suspicious type.
Sion ...	19,601	51	157	208	50	147	1	278	1,315	
Mahim ...	18,505	289	533	822	229*	684	61	119	621	* Out of these 1 case was of Relapsing fever.
Worlee ...	25,493	269	555	824	226	432	43	5	875	
		1,047	1,972	3,019	929*	1,875	120	765	6,947	* Vide remarks above.
<b>Central District—</b>										
Chukla (Portion) ...	10,733	40	13	53	39*	49	3	5	...	* Out of these 2 cases were of suspicious type.
Umerkhar (Portion) ...	39,349	203	81	284	192	259	11	10	349	
Bhuleshwar (Portion)...	15,012	106	76	182	90	217	16	25	160	
Khara Talao ...	27,035	160	180	340	145	499	15	11	782	
2nd Nagpada ...	18,768	154	123	282	114	644	40	3	283	
Byculla (Portion) ...	15,801	236	196	432	224	734	12	8	2,899	
		899	674	1,573	804*	2,502	97	62	4,413	* Vide remark above.
Total...		9,389	8,164	17,553	8,669*	18,806	881	2,722	54,252	* Out of these 93 cases were of Relapsing fever and 68 were of suspicious type.



**Inoculation.**

On the 19th July 1898 the Health Officer applied for a grant of Rs. 500 to compensate people of the poorer classes who might be debarred for 2 or 3 days from their ordinary employments through having undergone the operation. This application was complied with. On the 17th August a discussion took place in the Standing Committee on the motion of Dr. N. N. Katrak and there was a strong consensus of opinion that inoculation should be pushed in Bombay in anticipation of a further outbreak of plague. This led to consultation between the Municipal Commissioner and M. Haffkine on the 29th August. It was followed by a series of weekly meetings at which the Commissioner consulted M. Haffkine, the Executive Health Officer, the Hon'ble Dr. Bhalchandra Krishna, Dr. Katrak and others. An inoculation station was already open at the Laboratory, Khoshroo Lodge, and from 1st September 1898 Drs. Trilokkeker, Kalapesi and D. K. Patel agreed to undertake the duty of honorary inoculators going round the localities in which their practice lay and endeavouring to persuade their acquaintances of the value of the prophylactic treatment. On the 13th September a special inoculation allowance was sanctioned for Dr. B. S. Shroff, and Dr. Rajaballi V. Patel ; the latter being one of the Sectional Medical Officers on plague duty who had already had some measure of success in this direction. About the middle of October a special inoculation shed was erected on the maidan opposite the Municipal Office. Later on 23rd January special inoculation allowances were made experimentally to Drs. Britto and K. B. Shroff, Sectional Medical Officers in C Ward and D Ward, and from the 10th February to Dr. Godinho, Medical Officer in E Ward. An allowance was also made to Dr. Sorabji D. Desai, who was placed in charge of an inoculation station at Dharavi in the north of the Island (F and G Wards) under the patronage of Mr. Adamji Peerbhoy, who induced most of his factory hands there to undergo the operation. Meantime the Commissioner had used every endeavour to enlist in this cause the leaders of all sections of society, and a meeting of the most influential gentlemen among Marathi speaking Hindus was held in the Municipal Hall on the 13th October. This meeting was addressed by the Hon'ble Dr. Bhalchandra Krishna and by Dr. Katrak, and an almost unanimous feeling in favour of inoculation was on that occasion evinced. Dr. Bhalchandra had already in September addressed a meeting of Hindu gentlemen at his own house, distributing hand-bills explaining the results achieved by inoculation, and he followed it up by addressing a mass meeting on the occasion of the Dussera festival, 24th October, at the gathering of the Arya Mitra Mela in Madhav Bag. It was at this time that the results secured at Hubli had just become available, and at the meeting thousands of hand-bills summarizing those results were scattered broadcast. On the 27th October an inoculation station was opened in the Walkeshwar Temple compound at the house of Mr. Ranchordas Tribhovandas under the auspices of Mr. Mulji B. Barbhaya and other influential gentlemen, and here, too, Dr. Bhalchandra addressed the meeting. Mr. Lakhmidas

Khimji opened another station at his residence in the presence of the Municipal Commissioner, M. Haffkine and other officers. On this occasion Dr. B. S. Shroff, who undertook to perform the operations, explained the value of the treatment, and Dr. Bhalchandra met certain objections raised by the Secretary of the Jain Community. This gentleman was afterwards taken round the Laboratory at Khoshroo Lodge and the whole system of preparation of the lymph was carefully explained to him. Later on 13th January 1899 the leading gentlemen of the Gujarathi speaking Hindus were invited to a meeting in the Corporation Hall. This meeting was addressed by the Hon'ble Dr. Bhalchandra, Dr. Katrak, M. Haffkine and others, but there was little enthusiasm and only 20 out of about 70 gentlemen invited put in an appearance, while some of those who came showed a disposition to question the value of inoculation and to criticise the process. Their attitude was in some measure due to the evidence of Col. Lawrie, I.M.S., before the Indian Plague Commission and the uncontradicted statements of Captain Johnston, I.M.S., criticizing the composition of the lymph, which had appeared in the daily papers.

These statements gave rise to much discussion among the educated classes of Bombay, greatly strengthened the hands of those who opposed inoculation on the ground that the operation was unorthodox, dangerous and useless, and any chance of protecting Bombay at that critical moment by creating a popular and universal demand for the prophylactic treatment was destroyed. It was considered in the then state of public opinion both undesirable and futile to adopt any more energetic measures to push the matter.

In addition to the meetings above referred to the Commissioner had in October interviews with the leading gentlemen of the Bhattia Community, which resulted in the opening of the inoculation stations at Mr. Lakhmidas Khimji's house already referred to. He invited Dr. Accacio DaGama and Dr. Rozario, gentlemen of influence among the Portuguese and Goanese communities, to discuss matters with him at the beginning of November, but was advised by them that there was little chance of success. He asked some of the principal Borah gentlemen to meet him on the 24th November, but only one Mr. Abdul Hossein Adamji Peerbhoy responded. His response was, however, very cordial, and a mass meeting was organised which was attended by Sir A. Wingate, K.C.I.E., I.C.S., the Municipal Commissioner and other officers. The High Priest of the community, who presided, addressed them in moving terms, and by midday 263 persons were inoculated, Mr. Adamji Peerbhoy himself setting the example. Khan Bahadur Abdul Razzak bin Curtas threw himself vigorously into the cause, and it was no small achievement to succeed, as he did, in inducing some 70 Julahis to undergo the operation during October. Small funds were entrusted to him to reconcile them to the reactionary fever and the loss of money entailed. In the beginning of November Rao Bahadur Bhaskerrao



Balkrishnaji Pitale had a gathering in his own house at which the advantages of inoculation were impressed upon ladies and gentlemen alike. On the 30th October 1898 a meeting of the Telugu and other Hindu residents of Kamatipura was held, and the President, Rao Bahadur Ellapa Balaram, put the question clearly before the meeting, generously promising himself to contribute towards the support of those who might be temporarily debarred from earning their daily bread by the effects of the inoculation, and promptly advancing a considerable sum for this purpose. On the 1st, 5th and 8th November the subject was discussed by the Bombay Medical Union and a resolution in favour of inoculation was passed by an overwhelming majority, the four dissentients being Drs. N. H. E. Sukhia, Dr. Khaja Abdula, Dr. M. G. Deshmukh and Dr. G. B. Kher. The Plague Commissioner, in his Circular No. 2178 of 2nd September 1898, placed the seal of approval upon inoculation, and in view of the encouraging results at Hubli directed, under certain conditions, exemption of persons holding inoculation certificates from detention while travelling, and from segregation. The same concession to inoculated travellers was made by the Bengal Government on 3rd October 1898. Inoculation was one of the subjects to which the Parsee Panchayet devoted special attention; a large number of medical men offered their gratuitous services, hand-bills explaining the value of the prophylactic were freely distributed and lectures were delivered during October by Drs. Katrak and Ranina and Khan Bahadur Darasha Ruttonji Chichgar. Dr. Katrak also addressed at the Madhav Bag on 5th October 1898, a meeting of the Kapol Bannia caste convened by Mr. Tribhovandas Mangaldas, Mr. Harkissandas and Mr. Tribhovandas Varjivandas, and on several occasions spoke to small gatherings at his dispensary and elsewhere in favour of inoculation, and endeavoured to move the Mill-owners' Association on the subject. Dr. A. G. Viegas is another citizen who was convinced of the great possibilities of inoculation and did his best to push it. Messrs. Vassantrao Nana Moroba and Vamanrao Nana Moroba placed a fine hall at his disposal, and 141 operations were performed there between 6th December and 6th February.

The following table shows the actual number of operations performed in Bombay during the year :—

Names of Operators.	Total number of Inoculations done from 24th May 1898 up to 31st May 1899.	
	Persons newly inoculated.	Persons previously inoculated.
Dr. Henderson ... ..	2	...
„ N. N. Katrak ... ..	99	217
„ D. K. Patel ... ..	469	116
„ B. S. Shroff ... ..	182	353
„ R. V. Patel ... ..	5,162	21
„ C. F. Dalal ... ..	72	...
„ Miss Bradley ... ..	148	171



Names of Operators.						Total number of Inoculations done from 24th May 1898 up to 31st May 1899.	
						Persons newly inoculated.	Persons previously inoculated.
Dr. Shivdas Purmanandas	...	...	...	...	...	3	3
" S. V. Kantak	...	...	...	...	...	270	26
" Purshotum Harichand	...	...	...	...	...	147	74
" S. S. Missir	...	...	...	...	...	56	...
" B. R. Desai	...	...	...	...	...	10	...
" D. M. D'Silva	...	...	...	...	...	3	11
" A. P. Kothare	...	...	...	...	...	34	...
" D. B. Naik	...	...	...	...	...	121	55
" Ranina	...	...	...	...	...	9	28
" K. B. Shroff	...	...	...	...	...	374	316
Capt. Milne	...	...	...	...	...	14	31
Major Collié	...	...	...	...	...	14	2
Dr. N. D. Pathare	...	...	...	...	...	3,544	19
" D. C. de Quadros	...	...	...	...	...	349	538
" V. B. Jayakar	...	...	...	...	...	1,630	48
" Abadan	...	...	...	...	...	594	2
" Godinho	...	...	...	...	...	734	...
" A. S. Paymaster	...	...	...	...	...	41	181
" M. N. Kapadia	...	...	...	...	...	559	30
" C. L. D'Avoine	...	...	...	...	...	125	2
Laboratory Officers	...	...	...	...	...	1,226	1,755
Dr. Underwood	...	...	...	...	...	17	10
" S. S. Batliwala	...	...	...	...	...	18	24
" Sorabji A. Doctor	...	...	...	...	...	3	2
" K. E. Master..	...	...	...	...	...	69	34
" R. M. Kalapesi	...	...	...	...	...	54	299
" V. S. Trilokekar	...	...	...	...	...	161	488
" H. K. Tavarua	...	...	...	...	...	30	...
" Guzdar	...	...	...	...	...	19	36
" Ebrahim	...	...	...	...	...	102	11
" Jehangir J. Cursetji...	...	...	...	...	...	2	9
" A. G. Viegas...	...	...	...	...	...	26	28
" R. T. Nariman	...	...	...	...	...	25	1
" K. S. Engineer	...	...	...	...	...	9	22
" A. Britto	...	...	...	...	...	18	8
" S. D. Desai	...	...	...	...	...	138	275
" De Monte	...	...	...	...	...	27	1
" A. D. Modi	...	...	...	...	...	9	7
" H. N. Seervai	...	...	...	...	...	114	127
" Cowasji Pestonji	...	...	...	...	...	11	30
" Miss G. Karmarkar	...	...	...	...	...	7	11

It will be seen that the only officers who obtained any appreciable success were Dr. R. V. Patel, Dr. N. D. Pathare, Dr. V. B. Jaykar and the laboratory officers, and it is curious that so large a proportion of the work done should have been in three sections of E Ward. Dr. Patel worked chiefly in Tarwari, Dr. Jaykar in Byculla, Dr. Pathare in Mazagaon and the Laboratory, Khoshroo Lodge, is also in Tarwari. Considerable sums were spent during September and the beginning of October in compensating the poor for the loss of wages during the reactionary fever, but it was felt that inoculation was never likely to succeed if its claims were to rest upon a pecuniary reward; and on the 19th October the amount payable by way of compensation was limited to a maximum of annas 4 to be paid only on the day subsequent

to the operation and only to those really in need of it. Dr. Pathare owed much of his success to his large practice and great influence in his neighbourhood. Those who were inoculated were always of the poorer classes and always received a small pecuniary compensation. He also employed agents to collect persons willing to undergo the treatment. His death from plague was a great loss to the cause of inoculation. Dr. Patel's work was carried out largely in connection with his duties as a Sectional Medical Officer. When it became advisable to remove contacts or the inhabitants of an infected locality to camp, the alternative of inoculation was systematically offered to the people, and on the whole readily accepted. Great credit is due to Dr. R. V. Patel and to Mr. George Lund and Khan Saheb B. R. Ashburner, who co-operated and assisted in the work. The careful collection of inoculation statistics is difficult in a city so large as Bombay, but the following table showing the number of inoculated and uninoculated and the number of plague cases among them in four sets of chawls where Dr. Patel worked is of interest.

The total number of people in the house.	The number of the inoculated.	The number of the uninoculated.	Plague cases in the uninoculated.	Plague in the inoculated.	Remarks.
<i>The Telang Chawl, No. 6, Mazagon Road.</i>					
755	387	368	23	Nil.	
<i>The Khadah Chawls, No. 41, 43, 45, Nesbit Road.</i>					
407	243	164	4	1	Was inoculated once only on the 4th August 1898; died of plague on the 25th Jan. 1899.
<i>The Hyderally Chawls, Parel Road, No. 8.</i>					
411	165	246	6	Nil.	
<i>The Tulsidas Wadi, No. 9, Victoria Road.</i>					
151	All inoculated, they enjoy good health, notwithstanding plague in the immediate vicinity just opposite.				

Inoculation was pushed on similar lines in D Ward and E Ward West and elsewhere, but without any great success. In B Ward South M. Haffkine addressed a meeting of the Lohana Committee, and Lt. Brackenbury had himself inoculated in their presence and through the influence of Rao Bahadur Karamsi Damji a few of the coolie mukadams at the docks were induced to undergo the operation, but in neither case did these efforts bear any further fruit. The people undoubtedly regard inoculation with suspicion; and many still believe that it may produce leprosy, wasting, loss of vitality, loss of memory or phthisis. Except when plague is actually threatening them they are unwilling to undergo the unavoidable pain and discomfort associated with it: it is to them a new thing, and they readily seize upon any and every possible and impossible objection to it. Many would say that they would undergo it if it was a certain protection against plague, but are not prepared to suffer the inconvenience for the sake of merely increasing their chances

of immunity ; they seem unable to realise the extent to which their chances are increased, or to have any idea of estimating chances, and regard the death of a single inoculated person as proof that the treatment is valueless. A few are withheld by the belief that the protection afforded is merely temporary, and do not regard immunity for six months as sufficient reward for the 2 or 3 days' reactionary fever.

Such are the principal reasons which have prevented the prophylactic treatment becoming popular in Bombay, and it is needless to point out how disastrous to the cause were the evidence given before the Indian Plague Commission by Colonel Lawrie, and the absence of any contradiction of it.

#### Destruction of rats.

The following statement shows the number of rats destroyed in Bombay, during 12 months ending 31st May 1899 :—

Ward	June.		July.		August.		September.		October.		November.	
	1897	1898	1897	1898	1897	1898	1897	1898	1897	1898	1897	1898
A ... ..	...	...	...	48	...	59	...	44	...	1,348	...	3,715
B ... ..	...	...	...	33	...	1,101	...	3,388	...	7,241	...	5,615
C ... ..	282	864	190	359	149	630	128	1,429	133	2,783	291	2,854
D ... ..	...	...	...	102	...	191	...	234	...	248	...	285
E ... ..	...	...	...	752	...	5,145	...	5,636	...	5,391	...	5,124
F ... ..	...	...	...	29	...	22	...	66	...	125	...	28
G ... ..	...	...	...	51	...	229	...	309	...	205	...	132
	282	864	190	1,374	149	7,368	128	11,106	133	17,341	291	17,753

Ward.	December.		January.		February.		March.		April.		May.		Total.
	1897	1898	1898	1899	1898	1899	1898	1899	1898	1899	1898	1899	
A ... ..	...	5,095	...	5,478	...	4,864	...	3,606	...	5,356	...	5,622	35,286
B ... ..	...	11,313	...	17,288	...	2,605	...	9,856	...	11,894	...	11,470	61,804
C ... ..	420	4,328	1,350	6,592	1,541	4,489	2,161	2,201	1,089	1,064	1,054	760	37,141
D ... ..	...	270	...	250	1,469	314	641	498	426	485	...	478	5,891
E ... ..	...	6,495	...	6,202	...	1,794	797	584	...	569	...	416	38,905
F ... ..	...	33	...	29	...	39	...	36	...	36	...	32	475
G ... ..	...	83	...	66	...	64	...	64	...	53	...	31	1,278
	420	27,617	1,350	35,905	3,010	14,169	3,599	16,845	1,515	19,457	1,054	18,809	200,729

There were 20 men employed at various times during the year for the sole purpose of catching rats and they destroyed 13,144 of the above total. For the rest  $\frac{1}{2}$  anna per rat was paid from Municipal funds. B Ward is the centre of the Bombay grain trade and contains the principal docks. These facts are enough to account for the large proportion of rats destroyed there.



## CHAPTER IV.

### Measures Adopted—*contd.*

#### Disinfection.

The orders regarding disinfection issued by the late Plague Committee (printed at pages 181 and 182 of Sir J. Campbell's report) continued in force. The preparation of the disinfecting solution was carried out at the various district offices. From time to time during the course of the year samples were taken of the disinfectant in actual use, and as the results were not altogether satisfactory, it was thought desirable to have the disinfectant prepared on a uniform system at a Central Laboratory under skilled supervision. Dr. Cayley was placed in charge of this work, and his report upon it is given below :—

I have the honour to submit my report on the organization and work done at the Central Depot for the preparation of disinfectants.

The Central Depot for the preparation of the Perchloride of Mercury solution to be used as a disinfectant in Bombay was established on March 16th of this year. A room at the Municipal Drainage Chowkey, in Foras Road was fitted up for the preparation and storing of the disinfectant. Water was laid on to the room from two sources.—(1) by a pipe leading directly from the main; (2) by a pipe connected with an iron storage cistern erected outside the building. A *mori* with raised sides was erected in one corner of the room. The necessary cupboards, tables, &c., were supplied and the preparation of the disinfectant was begun on March 22nd. The following staff was engaged :—

Medical Officer in charge.

One European Inspector.

One Clerk.

Four Coolies. After April 3rd (three Coolies only were employed).

The prepared disinfectant is distributed to, and utilized in, the various districts in Bombay in the following manner :—

The disinfectant prepared at the Central Depot contains 10 per cent. of Perchloride of Mercury and 20 per cent. of Hydrochloric Acid. It is issued in stoneware screw stoppered jars of a capacity of  $2\frac{1}{2}$  gallons. One hundred jars of the prepared solution are kept constantly in stock. This number is found to be sufficient to meet any demand. A solution of Perchloride of Mercury tends to decompose, if kept for any length of time, even when enclosed in screw stoppered jars away from light and air. It was not considered advisable, therefore, to keep in stock a larger quantity of the solution than was absolutely necessary.

To each jar containing the prepared solution is attached a label marked "Perchloride of Mercury solution 1 in 10," the date of preparation and the number of the jar prepared. To prevent accidents a poison label is also attached to each jar and the solution is coloured with Methylene Blue.

*The Method of Issue.*—The District Officers indent for the number of jars they require directly on the Medical Officer in Charge. A hand cart is sent up with two or three coolies to whom the jars are delivered. The jars are packed on the cart

with straw and taken to the District Office. If there are any empty jars to be returned from the District Office they are brought to the Central Depot by the coolies on the hand cart. A receipt is given by the District Officer for the number of full jars he receives and the clerk at Foras Road gives a receipt for the number of empty jars returned.

The strong 10 per cent. solution is diluted before use. Each District Officer is provided with a cup holding, when quite full, six ounces, and also with wooden buckets holding, when nearly full, 380 ounces. The Perchloride solution is intended to be used of a strength of 1 in 760. Five ounces of this strong 1 in 10 solution contains  $\frac{1}{2}$  ounce of Perchloride of Mercury, and this when made up to 380 ounces with water gives the strength required. In order to give a margin for errors the cups used have a capacity of six ounces, but as in practice the cups are never quite filled approximately five ounces are added to each bucket of water.

The whole procedure is simplified as far as is possible—wooden buckets and cups of a definite size are provided, and one cup full of the solution issued from the Central Depot has to be added to each bucket of water, and the resulting mixture consists of a solution of Perchloride of Mercury of the strength required. Wooden rods are used for stirring the mixture in the buckets after the contents of the cups have been added to them.

E Ward West was the first District in Bombay to be supplied with the strong Perchloride of Mercury solution. This was on March 28th when 20 jars were issued. The disinfectant was issued to the other districts by degrees until by the end of May all the Districts were being supplied with the exception of C Ward. This ward was not supplied with the disinfectant until the beginning of June.

The total number of jars of the disinfectant issued up to the end of May was 578, divided amongst the different districts as below :—

A Ward	...	...	...	Jars	30
B „ North	...	...	...	„	88
B „ South	...	...	...	„	50
D „	...	...	...	„	20
E „ East	...	...	...	„	125
E „ West	...	...	...	„	145
E „ Ripon Road	...	...	...	„	85
F & G Wards	...	...	...	„	35
Total...					578

*Methods of Preparation.*—At first the Perchloride of Mercury solution was prepared in a large earthenware tub holding 8 gallons. As Perchloride of Mercury is nominally soluble, weight for weight, in Hydrochloric Acid, 80 lbs. of Perchloride were added to 8 gallons of Hydrochloric Acid. Two pints of this solution contained  $2\frac{1}{2}$  lbs. of Perchloride, so when 2 pints of this solution were added to the  $2\frac{1}{2}$  gallon stoneware jars and the jar filled up with water the necessary 10 per cent. solution was obtained.

Great difficulty was experienced in dissolving such a large quantity of Perchloride of Mercury and the time taken was so long that in the next series of jars prepared only 40 lbs. of Perchloride were added to 6 gallons of acid and 2 of water. Although the Perchloride dissolved more readily than when the larger quantity was used, it was found that more than 24 hours was required to effect complete solution. In the end it was found that there were fewer sources of error and that it was quicker and more convenient to prepare the 10 per cent. solution directly in the



stoneware jars used for issue. The method of preparation finally adopted is as follows :—Into each jar four pints of Acid are measured and after the addition of the Acid  $2\frac{1}{2}$  lbs. of carefully powdered Perchloride of Mercury are slowly added while the whole is being briskly stirred with a wooden rod. The Perchloride is dissolved in a few minutes and the jar is filled up with water. The solution thus prepared is kept for 24 hours when it is examined, and if the solution is clear and there is no deposit the Methylene Blue is added and the stopper screwed up tightly. The jar is then labelled and set aside to await issue.

A saturated solution of Methylene Blue is prepared by dissolving the crystals in a mixture of acid and water. Two ounces of this solution is added to each jar. It was found necessary to dissolve the Methylene Blue before adding it to the disinfectant solution as the crystals would not dissolve when added to a solution containing Perchloride of Mercury.

The Perchloride of Mercury is supplied in brown paper packets weighing about 28 lbs. each. Tests are applied to samples from each packet to ascertain the purity or otherwise of the Perchloride supplied. The tests used are—

1. The solubility in water. It should dissolve in excess of water on gently heating without leaving any residue.
2. When the crystals are heated in a test tube the whole should sublime and be deposited on the cold part of the tube in the form of a thick white powder.
3. On the addition of Iodide of Potassium to a solution of the salt in water a red precipitate (Iodide of Mercury) should form which re-dissolves on addition of excess of the Iodide solution.

The Perchloride supplied was very pure and in every case conformed with the above tests, with the exception that in a few of the packets that had got damp a small proportion of the Perchloride had been converted into the brown Carbonate of Mercury. The amount of carbonate present in any individual packet did not exceed a few grains in weight.

In some of the packets a few small pieces of glass were found, but practically no adulteration was present and none of the Perchloride had been converted into the subchloride (calomel).

The Hydrochloric Acid is supplied in stone screw stoppered jars holding 20lbs. of acid. The acid was supplied in jars of 2 kinds, *i. e.*, with small stoppers and with large stoppers. The acid in the first of these jars was the best in quality. In the majority of the jars the quality of the acid was good, but 5 jars had to be returned as they had evidently been diluted with water. In the jars containing this diluted acid the stoppers were loose and had evidently been recently tampered with. When the stoppers were tightly screwed on, the acid was always found to be of full strength. No direct tests were applied to ascertain the strength of the acid, but if the acid did not give off dense fumes when exposed to the air the jars were rejected and returned to the contractor who replaced them with others of full strength. The acid is syphoned out of the jars by means of a glass acid syphon into a measured glass jug, from which it is poured into the issue jars.

Some experiments were carried out to ascertain the quantity of acid that should be added to each jar in order to get the full effect of the germicidal action on the Plague Bacillus. It was considered advisable to add sufficient acid to render cowdung floors acid in reaction for a period of at least 24 hours. At first



2 pints of acid were added to each jar giving a strength of 1 in 760 to the diluted solution. With this quantity of acid the cowdung floors gave an acid reaction for from 8 to 11 hours.

The amount was then increased to 3 pints per jar giving a strength of about 1 in 500 in the diluted solution. This rendered the floors acid for periods varying from 12 to 18 hours.

Four pints were then tried, giving a strength to the diluted solution of 1 in 380. This amount rendered the floors acid for at least 30 hours after disinfection. In the preparation of the solution therefore four pints was fixed upon as the amount of acid necessary to be added to each jar.

The acid in the solution acts as a solvent for the Perchloride. It also acts as a solvent of any albuminate of Mercury that may be formed allowing the Perchloride therefore to penetrate through what would otherwise have been an impervious covering protecting the germs. In addition to these two actions the Hydrochloric acid has a distinct germicidal action of its own on the Plague Bacillus and is itself a good disinfectant for this purpose. By rendering the floors acid for periods of 24 hours after disinfection this disinfectant action is continued after all the Perchloride of Mercury has been decomposed. In the first series of jars prepared, Sodium Chloride was added to assist the solution of the Perchloride. The salt supplied was covered with mud containing organic matter which actually decomposed the Perchloride, although the salt was washed as carefully as possible and strained through several layers of cloth. The use of the Sodium Chloride was dispensed with and it was not considered necessary to replace it with Ammonium Chloride as the amount of Hydrochloric acid used was considered sufficient to effect all that was required.

In a number of the jars a greyish muddy looking sediment was deposited after the solution had been standing for 3 or 4 days. On testing the deposit it was found to consist of Mercury in a very finely divided state with some organic matter. Experiments were made to discover the source of this deposit and it was found to be due to the organic matter contained in the water used for the preparation of the disinfectant. When distilled water was used instead of water from the main no sediment was deposited. It was also found that the sediment was less when water from the main was used than when water from the cistern was used. The water from these two sources was analysed and found to contain a considerable amount of organic matter both in suspension and in solution. By filtering the water through several layers of cloth the organic matter in suspension was removed and the sediment deposited, when this filtered water was used, was lessened in amount, but was not entirely removed. This sediment was caused by the organic matter in solution. The formation of this sediment could only be prevented by the use of distilled water, but as distilled water in the large quantity required was not available, an additional quantity of Perchloride of Mercury was added to each jar sufficient to cover any loss from this cause.

On 16th May 1899 the sediment that had been deposited in 73 jars was collected, dried and weighed. The total weight was four ounces giving an average of 24 grains for each jar. The water that had been used in the preparation of these jars had not been filtered.

On 31st May 1899 the sediment from 35 jars was collected and weighed. It averaged  $9\frac{1}{2}$  grains to each jar. The water used in the preparation of these jars had been filtered.

These results show that the actual amount of Perchloride decomposed in each jar is very small. The grey deposit consisted of finely divided Mercury and  $9\frac{1}{2}$  grains of Mercury correspond to 12·87 grains of Perchloride. So by using filtered water from the main the actual loss of Perchloride of Mercury in each jar averaged 12·87 grains out of  $2\frac{1}{2}$  lbs.

To counter-balance this loss an extra half ounce of Perchloride over and above the  $2\frac{1}{2}$  lbs. is added to each jar.

Every week samples of the prepared solutions in stock were analysed. Until the extra  $\frac{1}{2}$  ounce of Perchloride was added to each jar, the solution was often found to contain a small fraction less than the full 10 per cent. This loss was in part due to the decomposition of the Perchloride by the organic matter in the water, and partly to the alteration in the composition of the Perchloride which always takes place to a small extent when a solution of the salt is kept for any length of time. Some experiments made to ascertain the loss from this cause gave the following results :—

A solution when freshly prepared was found to contain on analysis..10 parts in 100.

After the same solution had been kept for four weeks it contained..9·982 do.

After eight do. ..9·954 do.

*i.e.*, after four weeks there was a loss of 31·5 grains of Perchloride of Mercury and after eight weeks 80·5 grains.

As stated above an extra half ounce, *i.e.*, 218·75 grains, is now added to each jars. This is sufficient to cover the loss from keeping and the loss due to the organic matter in the water and at the same time to leave a margin for any further loss.

Analysis made after the addition of this extra  $\frac{1}{2}$  ounce showed that the solution always contained the full 10 per cent. of Perchloride of Mercury.

Several analyses were made of the diluted solutions taken from the buckets of the solution actually being used for disinfection. The samples varied in strength from 1 in 700 to 1 in 750. This increase of strength over the theoretical 1 in 760 showed that a little more than 5 ounces of the 10 per cent. solution was being added to each bucket. The cups used for measuring out the strong solution hold, when quite full, 6 ounces. This accounts for the excess of the strong solution added.

In the preparation of the disinfectant care is taken that no apparatus or materials are used that can in any way react on the Perchloride. The Perchloride is kept in paper packets, it is powdered in a China mortar with a China pestle. The acid is syphoned from the acid jars with a glass syphon, and glass or China jugs only are used for measuring the acid and for transferring it to the jars.

The cups supplied to the District Officers were at first enamelled iron cups. They had no effect on the Perchloride solution at first, but the enamel was soon eaten away and the iron exposed, so these cups were replaced by similar cups made of thick glass.

No change was made in the orders regarding disinfection, but towards the close of the year when the epidemic was declining it was felt to be desirable to emphasize the necessity of uniformity and thoroughness in disinfection; and on receipt of a report from Dr. Cayley, detailed instructions were drawn up in consultation with him for the guidance of all District Officers and forwarded to them together with his report.



His report and the instructions issued are printed below :—

**Dr. Cayley's** SIR,  
**Report.**

I have the honour to report that Mr. Clark, the Superintendent of Disinfection in the Central District, has consulted me with reference to the disinfection of clothes, leather, &c.

The solution of Perchloride of Mercury, as supplied from Foras Road, is not suitable for disinfecting clothes, owing to the large percentage of acid that it contains.

It is most important that the clothes, bedding, &c., of an infected person should be disinfected. I find that it has been the custom in the Central District to burn those articles that were of small value and to leave the remainder untouched. The best method of disinfecting clothes is undoubtedly in a steam disinfector. Owing to the distances and the number of articles requiring disinfection this is not practicable. To disinfect the clothes phenyle might be used. As it is not convenient to keep clothes for a long time in the solution of phenyle, it is necessary to make the solution a strong one. A suitable solution could be made by adding a cupful of phenyle to a bucket of water, using cups and buckets of the same size as those now used to make the diluted Perchloride solution. As soon as the disinfecting party enters a house for disinfection, the clothes should be collected and placed in a tub or tubs of the phenyle solution made of the strength given above. They should be left in the solution until the disinfection of the room is completed and should then be wrung out and hung up to dry. The time occupied in disinfecting a room is over 20 minutes, which will give ample time to disinfect the clothes using phenyle of the above strength. Leather cannot be soaked in the solution in the same way without spoiling it. Leather should be well swabbed all over with a cloth dipped in phenyle solution, for this purpose the phenyle solution should be stronger than that given above. In making the solutions the phenyle should be put in the bucket before adding the water—for making a solution for treating leather the bucket should only be half filled with water. After the leather has been thus treated the bucket can be filled up with water, and the solution used for clothes. A tub once filled with phenyle can be used for a series of clothes.

For bedding, mattresses and other similar bulky articles, the only method to efficiently disinfect these is to have them carted to the steam steriliser and there disinfected. It is only occasionally that articles of this description will be found in infected rooms, and I think it would be practicable to have them treated in this way.

I have found that a distinction is being drawn between so called suspicious cases and cases of undoubted plague. This is not very logical, and in all doubtful cases the disinfection should be as thorough and complete as in cases of plague. There is no doubt that efficient disinfection is the main factor in stamping out an epidemic of an infectious disease. Now that there are only a few cases to deal with disinfection can and should be carried out most thoroughly. More time can be spent on individual cases, and in every room in which a death occurs, unless the cause of death is absolutely above suspicion, should be thoroughly disinfected. The period which intervenes between two epidemics, and the very early stages of an epidemic are the only times when the disease can be coped with, and when thorough disinfection is likely to have any real effect in stamping out the disease.

I have the honour to be,

Sir,

Your most obedient Servant,

C. H. CAYLEY.



When a Plague case occurs disinfection should in future be carried out as follows :—

**Instructions  
for Disinfection.**

1. The room and the whole of its contents must be disinfected, also adjoining rooms which have, through doors, windows, cracks or crevices, any direct connection with the room where the case occurs; also the latrines, the passage on which the room opens, and the passage of all floors below, together with connecting staircase.

2. First the bedding and any soiled clothes belonging to the patient should be secured, carefully picked up, taken outside and burned. If specially valuable they may be sent to the nearest steam sterilizer.

3. All other bedding and clothes in the room, whether lying about or contained in boxes or cupboards, should then be collected and carefully taken out and sent to the nearest steam sterilizer. If the distance is great or there are other difficulties they may be soaked in a solution of phenyle or carbolic acid for at least 30 minutes.

*Note 1.*—The solution of Perchloride of Mercury now being supplied should not be used for this purpose, as it is likely to be destructive owing to the quantity of hydrochloric acid present in it.

*Note 2.*—In the case of very valuable clothes, and if a steam sterilizer is not available, mattresses or bulky articles which cannot be conveniently soaked in a solution, as above, should be either hung up or spread out in the sun.

4. Boots and articles of leather should be carefully rubbed over with a cloth soaked in a strong solution of Phenyle or Carbolic Acid.

5. Metal or earthen cooking pots need not be disinfected if the people strongly object, otherwise they should be washed with solution of Phenyle and Perchloride of Mercury, respectively.

6. Books and paper should be carefully dusted, unless the owner consents to their destruction.

7. Furniture and boxes in the room should be mopped on the outside with a cloth soaked in the Perchloride solution; they should then be taken out and thoroughly washed inside and out with the Perchloride solution.

8. Articles of food should, so far as possible, be spread out in the sun.

9. Rags and similar rubbish lying about in the rooms should be carefully lifted, removed and burned with the patient's bedding. In placing them outside they should be carefully laid down (not thrown down) so as not to raise a dust.

10. No brushing of floors or walls should on any account be permitted before flushing. This is a most dangerous proceeding and likely to spread infection.

11. The room itself should be systematically flushed with the solution of Perchloride. Special care being taken to thoroughly flood the floor if it is of mud or cow-dung.

12. It should be swept out and again flushed and cleaned on the following day :—

*Note.*—Where for any reason, *e. g.*, in merely suspicious cases it is necessary to allow the people to re-occupy the room without delay, the whole operation may be completed on the same day.

13. Passages and staircases should be similarly flushed and then swept and cleaned on the same day.

14. All windows and other methods of ventilation should be thrown as wide open as possible.

15. Latrines should be thoroughly flushed with plain water, a final flushing being given with a solution of Phenyle or Carbolic.

16. The whole neighbourhood of the house should be thoroughly cleaned up and all rubbish burnt.

17. Landlords should be encouraged to lime-wash their houses, after an interval of 24 hours, with hot quick-lime.

18. Where the people are sent to camp with their belongings the disinfection of their kit will ordinarily be done in camp where the same rules should be closely followed.

19. The disinfecting gangs should be for Hindu houses, Pardesi Brahmans or Marathas, and for Mahomedan houses Mussalmans. In the Fort and C Ward a couple of Parsis should be engaged to disinfect Parsi houses where deaths have occurred.

20. The greatest care should be taken to avoid all unnecessary damage.

21. The District Officer or his Assistant or the Sectional Medical Officer should endeavour to be present during disinfection.

22. Except for special reasons, disinfection should always be begun within 12 hours at most of hearing that a place is infected.

23. Carbolic powder is of little value except as a deodorizer, and its general use should be discontinued ; it may, however, be used where necessary to overcome offensive smells.

24. The solution of Carbolic Acid for soaking clothes in should be prepared by putting two of the measuring glasses, now supplied, full of the acid into the 2½ gallon bucket of water and stirring well, so as to thoroughly mix. The mixture should be stirred periodically while the clothes are soaking. Clothes should be loosely placed in the solution, not tightly packed, so that the disinfectant can get at every part of the clothes. When a strong solution of carbolic acid is referred to 3 cups full of the acid should be added to a bucket of water. Care in every case should be taken to thoroughly mix the acid in the water, as if oil globules of free acid are floating in the water they will burn the hands of whoever may wring out the clothes. If the hands are burnt with the Carbolic Acid the acid should be at once washed off with plenty of water, and if any oil, grease or ghee is available it should be applied to the injured part.

If phenyle is used as the disinfectant, the solution for disinfecting clothes should be prepared by adding *one* cup full of phenyle to a bucket of water. The strong solution should be prepared by adding *two* cups full of phenyle to a bucket of water.

#### **Sterilizers.**

At the beginning of the year two steam disinfectors were in use, one at Modikhana and one at Narielwadi. They have been described at pages 201 to 203 of Sir J. Campbell's plague report. The efficiency of these two disinfectors, the "Equifex" at Modikhana and the



“Bowman” at Narielwadi, was investigated by Dr. Marsh in the middle of April 1898. Regarding the “Equifex” he concluded his remarks as follows :—

“ The conditions under which these experiments were carried out were such as include the severest tests of the disinfecting action and penetrating power of steam through bulky articles, and the results obtained allow of the conclusion that under ordinary conditions of use the apparatus at the Modikhana Camp would prove efficient as a disinfecter.”

Regarding the “ Bowman ” sterilizer he wrote :

“ The process of disinfection proved sufficient to sterilize not only the comparatively feebly resisting plague bacillus, but also the more resistant hay bacillus and its spores. I have the honour, in conclusion, to state that I find the ‘ Bowman ’ apparatus to be an effective and easily managed disinfecter and a rapid and reliable drying machine.”

Another disinfecter lent by Government was erected in the Byculla camp. This was also of the “ Equifex ” pattern. These three disinfecters were of great use to the districts, camps and hospitals in their neighbourhood, and large quantities of clothing were passed through them.

#### Procedure.

The following note by Lieut. Warneford indicates the regular procedure in C Ward in the matter of disinfection—other districts followed the same general lines. The actual process of disinfection, where it differed from, has now been assimilated with the instructions laid down in the above quoted circular :

Disinfection has been carried on in the ward on a uniform system as described below, and while carrying it out thoroughly, every endeavour has been made, by the personal supervision of superior officers, to prevent damage or other cause for complaint, and especially the bribery and extortion of subordinates, which may be considered one of the greatest evils and hardships to which our plague work may give rise. The District Officer or an Assistant District Officer went round the houses for disinfection every afternoon to see the work which had been already executed in the morning and the afternoon’s work in course of execution, and this supervision kept a sufficient check on subordinates so long as the amount of work was small, but when the present recrudescence began in January it was found essential to have a trustworthy superior officer to superintend disinfection alone, and I consider that this system of having a superior officer to personally superintend disinfection has been the means not only of carrying out disinfection much more thoroughly, but also of minimising the possibility of hardship and complaint. The routine ordinarily observed in this ward in regard to the carrying out of disinfection is as follows :— When a Sectional Medical Officer has enquired into a plague case or death and has ascertained the actual place where the case used to sleep or live, he returns to the District Office and enters the case in a book. At the time of his making enquiries at the place he is supposed to mark the actual rooms that he wants disinfected with charcoal or pencil, and on entering the case in the book he must give the number of rooms to be disinfected and the floor that they are on. A disinfecting Sub-Inspector gives out the work from the book to each mucedam and gang and he and they are responsible that, unless the District Officer orders otherwise,



these particular rooms are disinfected and neither more nor less : on the arrival of the muccadam and his gang at the place, the rooms ordered are disinfected as laid down in the circular above quoted.

All houses were treated alike whether plague cases had occurred or whether the case was only suspicious, but in the latter case, especially in the Central District, endeavours were made to get the whole work done in one day so as to put the people to as little inconvenience as possible. Endeavours were also made at the end of the epidemic to disinfect houses which owners had locked up and deserted. The desirability of this was evidenced by the number of such houses where dead rats were found.

Captain Cuppage writes :

“ Apart from the disinfection of plague-infected houses or rooms, it is the practice in C Ward to open and thoroughly disinfect and clean any rooms, shops, lofts or dwellings of any kind that have been untenanted or unused and closed up for over a month. This has entailed very heavy work on the disinfecting staff ; and at the commencement the people objected to it, but patience, combined with firmness, justice and tact, gained the day, and there is now little or no difficulty experienced in carrying this measure out. I have known instances in which on the disinfecting staff arriving at a house of this kind the people have demurred, but on rats being found they themselves willingly set to and assisted our men in every way.”

Difficulties were specially experienced with the higher classes of Mussulmans, with Parsees, Bhattias and Bannyas in the matter of disinfection. In the case of the Mussulmans referred to the principal difficulty was when a death occurred. For 3 days after, during the performance of the ziarat ceremony, friends and relations congregate in and about the house, and during this time disinfection is practically impossible. The difficulty with the Parsees was very much the same, and can be and was got over in many instances, thanks to the assistance of the Secretary of the Parsee Punchayet, by using the services of Parsees to disinfect. The Bhattias and Bannyas are specially sensitive about intrusion upon their rooms and damage to their often valuable belongings, and their objections could only be overcome by the employment of Hindus of good caste and the exercise of great patience.

In all districts every endeavour was made to induce the owner of a house or chawl or his agent to be present while disinfection was going on, and either one or the other generally appeared. In some cases, however, they were unavoidably absent or persistently refused to come. On these occasions one of the Volunteers or two or three respectable persons living in the vicinity were called, and the work was carried on in their presence. When a door had to be broken open it was the practice to call in a police sepoy to see that no property was stolen, and in C Ward when the owner was absent it was usual to have all members of the disinfecting gangs searched

on entering and leaving the house. If the owners were poor the value of any articles destroyed was assessed on the spot and compensation paid. These measures were very successful, and one of the most gratifying features of the year's work has been the extreme rarity of complaints of loss or damage to property arising from plague measures.

In one of the few cases of complaint, the matter was at once put in the hands of the police, and it was found that a by-stander had entered the house while it was being evacuated and had rifled the contents of a box. He was tracked down, tried and convicted, and the property restored to the owner.

In the matter of ventilation, men were specially employed to remove the tiles in strips from the roofs of infected houses and of all houses in infected localities. Doors and windows were invariably left open after completion of disinfection till the house was re-occupied, bamboo partitions were often pulled down and holes occasionally made in walls where there was no other means of admitting light and air ; but in really bad cases the house was reported to the Executive Engineer for survey. The work done by his department in the matter of improving the buildings of Bombay is given in his report below.

**Improvement  
and demolition  
of insanitary  
buildings.**

During the year ending 31st May 1898, a systematic inspection of houses in the following districts, which was in hand at the commencement of the year was continued :—

- |                  |                  |
|------------------|------------------|
| 1. Lower Colaba. | 7. Dongri.       |
| 2. Fort.         | 8. Bhuleshwar.   |
| 3. Dhobitalao.   | 9. Kamatipura.   |
| 4. Chukla.       | 10. 1st Nagpada. |
| 5. Mandvi.       | 11. 2nd Nagpada. |
| 6. Umakhady.     | 12. Byculla.     |

The following additional districts were also taken up during the year :—

- |                 |                |
|-----------------|----------------|
| 1. Market.      | 4. Tardeo.     |
| 2. Kharatalao.  | 5. Walkeshwar. |
| 3. Kumbharwada. |                |

The inspection of houses in Kamatipura and in the Dhobitalao District has been practically completed and the improvement of several houses has been already carried out, while that of others is in progress. Stray cases in other parts of the city were also inspected when their improvement was urgently demanded. Altogether 2,553 houses were inspected during the year under review, of which 2,178 houses were found more or less in need of improvement, 364 houses were found incapable of improvement and fit for demolition, the remaining being such as not to require any improvement. In all 242 houses were actually demolished during the year.

**Notices.**

During the year 2,182 notices were issued requiring the house-owners to improve their buildings, out of which the owners of 838 houses took the work of improvement in hand, 714 houses had to be declared unfit for human habitation, out of which 76

houses were closed permanently for demolition, 350 temporarily for enforcing improvements in them, and 288 were declared unfit for human habitation to allow of action being taken for the immediate improvement of their ventilation.

**Compensation.** The amount of compensation awarded during the year by the Government Assessor for buildings condemned for demolition under Sections I and IX of the Notification was Rs. 8,880. Rs. 2,989-6-7 was paid by way of compensation during the year for huts and sheds demolished under Section 426 of the Municipal Act and a sum amounting to Rs. 1,154-1-5 still remains to be paid owing to the owners not having proved their title to receive the compensation awarded to them.

**Abatement of overcrowding.** As a rule the residences of the poor classes of the communities are insanitary, ill-ventilated and damp. Many of the rooms have absolutely no light or ventilation and the floors being low are generally damp and fruitful of disease. It is sometimes found that ten people live in a room hardly sufficient for one-fourth the number. Attempts have been made to abate the overcrowding in these buildings, but without much success, as it was found that the rooms were re-occupied shortly after the officers of the Municipality left the scene of action. The only remedy is to increase the amount of house accommodation and it is hoped that the work of the City Improvement Trust will help the City in this matter. Only one Inspector was employed during the year for inspection of houses with a view to abate the overcrowding. This work is, as stated above, difficult of accomplishment owing to insufficient house accommodation for the poor. The overcrowding was naturally found only in chawls occupied by the poorest classes of the people. Until sufficient house accommodation suitable for these people is provided, the effects of overcrowding must continue. Reduction is, however, more rigidly enforced in cases where the creation or spread of disease is apprehended.



## CHAPTER V.

## CAMPS.

Provision of  
Camps.

The Municipality inherited the marginally noted camps from the Plague Committee—of these the first 7 were retained and strengthened for the monsoon. The huts on high-lying ground at No. 8 were retained ; the rest demolished. All the other camps were pulled down, with the exception of a few huts, which subsequently proved uninhabitable at Byculla, and some huts appropriated to the use of Government peons at Kennedy Sea Face. Of the first 8 camps it may be noted that that at Modykhana was practically not used for purely Municipal purposes—a portion of its area had to be returned to the Port Trust authorities for the construction of kerosine oil sidings : about half of it was made over to the Port Health Officer, when with the rise of the epidemic it became necessary to discontinue the use of the Modykhana Hospital for observation cases detained at the Bandar : and the remainder was eventually made over to the Parsee Panchayet for use as a hospital and segregation camp. The camps at Sankli Street and Victoria Bandar were occupied by permanent residents and were never available for evacuation purposes. All the other camps except Wari Bandar were, during the monsoon, occupied by semi-permanent residents who had to pay a rent of Rs. 2 per hut : or in some cases Re. 1.

The question of providing ample camp accommodation was receiving attention before the close of the monsoon ; and a great stimulus was given to this work by G. R. <sup>6294</sup>/<sub>6405-P</sub> of 17th November 1898, communicating the generous grant by the Government of India of one lakh of rupees for expenditure independently of the Municipality on plague

- A Ward—Vittal Sayana camp.  
Cruikshank Road (2 camps).
- B Ward—Babula Tank camp.  
Umarkhari camps.—  
(i. Piru Lane.  
ii. Jail Road.)
- C Ward—Crawford Market camp.  
Kennedy Sea Face camp  
Northbrook Gardens camp.
- D Ward—Grant Road camp.  
Chowpatty camp.
- E Ward—Byculla camps.  
i. for Julais.  
ii. for Hindus.  
iii. for Mahars.  
iv. for Halalkhors.  
Gilder Street camps.  
Camp for Mussalmans,  
Narielwadi.  
Ghorupdeo camp.
- F and G Wards—Worli Koliwada camp.  
Mori Road camp.  
Elphinstone Road camp.  
Dadar camp.  
Worli Pakhadi camp.

camps in and near the City. The marginally noted public camps were erected and rapidly pushed forward during the cold weather. The Ellapa Balaram camp was also considerably extended by its generous founder. The Vittal Sayana camp also owed its origin to a gentleman of that name, who put it up in the first instance entirely at his own expense. All the other camps mentioned were erected from the funds placed at the disposal of the Commissioner by the Government, an account of which is here attached. It will be seen that this fund enabled the Commissioner to give different communities assistance in the erection of health camps of their own.

## EXPENDITURE on Plague Camps during the year ending 31st May 1899.

Month and Date.	Receipts.	Amount.	Expenditure.	Amount.
		Rs. a. p.		Rs. a. p.
December 8th, 1898...	Received from the Accountant-General, Bombay...	119 7 0	Erecting Camps at Gilder Street	...
January 10th, 1899...	Do. do.	10,000 0 0	Do. health camps for Mahars at Gilder Street	...
" 18th "	Do. do.	35 0 0	Do. camp of 100 rooms do.	...
February 20th "	Do. do.	20,000 0 0	Do. camp of 50 rooms do.	...
March 30th "	Do. do.	29,845 9 0	Constructing additional 100 sheds at Churney Road	...
July 3rd "	Do. do.	15,000 0 0	Do. 2nd do. 100 do.	...
			Do. camps at Marine Lines ...	...
			Do. a camp of 250 rooms at Kennedy Sea Face	...
			Do. public camps do.	...
			Erecting camps at Dadar ...	...
			Constructing 200 rooms at Morland Road	...
			Erecting health camps at Agripada, Morland Road	...
			Do. Hindu camps at Morland Road	...
			Constructing a shed for the Small Cause Court...	...
			Do. camps at DeLisle Road ...	...
			Do. do. at Jail Road ...	...
			Do. do. at Argyle Road ...	...
			Do. shed at Byculla...	...
			Erecting camps at Byculla (additional accommodation)	...
			Do. 10 Chawls for Hindus at Byculla ...	...
			Do. 16 Chawls for Julais at Byculla ...	...
			Do. Camps for Sweepers at Byculla ...	...
			Making additional 100 rooms to the Mahar Camps at Byculla...	...
			Erecting Camps at Cruikshank Road ...	...
			Do. do. at Babula Tank ...	...
				10,185 7 9
				2,978 13 1
				308 14 3

Erecting Health Camp at Ghorupdeo Road	...	...	...	3,376	6	8
Constructing 100 additional-rooms, &c., at Ghorupdeo Camp	...	...	...	219	15	1
Converting 2 huts at Government House, Parel, into 16 living rooms	...	...	...	146	13	0
Erecting health carps at Elphinstone Road	...	...	...	1,122	8	6
Constructing New Camps in Northbrook Garden	...	...	...	4,199	14	5
Do. Sheds on the South side of A. C. Market	...	...	...	220	8	6
Do. Camps at Inambara Ground	...	...	...	2,346	11	4
Do. Nurses' quarters at Modykhana	...	...	...	405	9	10
Do. huts at Piru Lane...	...	...	...	667	7	11
Converting Sheds into health camp at Grant Road	...	...	...	1,324	11	6
Constructing 50 huts for Dhobies at Arthur Road Hospital	...	...	...	982	6	0
Do. 40 huts at Worli Koliwada	...	...	...	2,176	3	3
Do. Hospital and camp at Narielwady	...	...	...	36	9	0
Do. 20 rooms in the Compound of Beni Israel Hospital	...	...	...	3,244	7	7
Do. 30 huts at Worli Pakhadi and erecting health camps at Valpakhadi.	...	...	...	1,966	1	0
Constructing 100 huts at Chowpati Distillery Site	...	...	...	605	0	10
Erecting huts at Bellasis Road (Shivlal Motilal Ground)	...	...	...	2	8	0
Inspector Solomon's travelling charges on different camps	...	...	...	7	10	0
Railway Pass to timekeeper of the Drainage Department to take muster at different Camps.	...	...	...	374	4	0
Carriage charges incurred for removing stores from Government House	...	...	...	1,034	11	2
Parel Stores to different camps.	...	...	...			
Drainage connections to different camps	...	...	...			
Total payment up to 31st May 1899	Rs.	...	Rs.	* 59,258	11	11
Balance in hand	Rs.	...	Rs.	15,741	4	1
Total	Rs.	...	Rs.	75,000	0	0

\* In addition to this sum Rs. 1,018-1-0 have been paid from 1st June 1899 to 7th July 1899 and bills for Rs. 9,500-0-0 are under Audit.



Sites for  
Camps.

Ellapa Balaram,  
Gilder Street,  
Victoria Bandar,  
Worli Pakhadi,  
Umarkhari,  
Grant Road,  
Ghorupdeo.

Of the various camps that were erected, those marginally noted were on private land. In the first two cases the land belongs to Mr. Shivilal Motilal, whose great liberality has enabled the Municipality to occupy it till now at a nominal rent. The site at Victoria Bandar belongs to the Colaba Land and Mills Company, and thanks are due to them for permitting the use of the land without payment. Land at Worli was generously placed at the disposal of the Municipality by Khan Saheb Mahomed Ibrahim though not used, and no rent has been asked for by Mr. Dosabhoj Cooverji Doctor, for the site of the Jail Road camp at Umarkhari, or by Mr. Tribhuvandas Varjivandas, and Mr. Kaitaun Bastansing for the sites of two small camps at Worli, Koliwada. In the other cases rent was fixed and paid.

The other camps were either on Municipal, Government, Port Trust or Improvement Trust land. Government charged no rent ; the Port Trust who originally charged full rates, eventually under pressure from Government reduced their rents to  $\frac{3}{16}$  of the ordinary rates : the Improvement Trust allowed the use of their property rent free, but where the land had been let out to cultivators, the Municipality had to pay them compensation.

This is a suitable point at which to acknowledge the great public spirit of Sir Dinshaw Maneckji Petit, who has now for more than two years, allowed the Plague Administration the free use of the large area of land occupied by extensions of the Maratha Hospital, and of Shet Haji Ahmed Nurani who has for a like period allowed the free use of the land occupied by the Sunni Hospital, Ripon Road, and during the year gave an additional piece for contact sheds. The generous loan by Mr. Mahomed Casum Kurtay of his house in Ali Umar Street as a place for segregation, is also deserving of special mention.

Accommoda-  
tion for cont-  
acts, &c., at  
Hospitals.

Great importance was attached to the provision of suitable accommodation for the families of patients in close proximity to the various hospitals : and, towards the close of the monsoon this was arranged for at Modykhana by the erection of a double row of huts, with accommodation for 48 persons, just outside the hospital precincts. At the Arthur Road Hospital no dry ground was available at that period, but three empty wards were converted to the purpose in question. Subsequently when the fair weather set in, 50 rooms were erected on low-lying ground close by. The three wards had to be re-converted to hospital purposes ; but two of them were again made available for the friends and relatives of patients, when at the close of the year, the approach of the monsoon necessitated the demolition of the huts on the low-lying ground. Huts were provided at the Mahommedan General Hospital when it was re-opened. A few huts were from the first available at the Sunni Hospital, but these were added to during the year under report. Similar accommodation was made available near the Sarvajanik Hospital, Government House, Parel, at the Stuart Strong Hospital, Colaba, and at the Mahim Hospital constructed

at the close of the year ; the desirability of these arrangements was impressed upon the Managers at the various private hospitals, and practically all those of importance either erected huts close by, or set aside rooms, or engaged neighbouring houses for the purpose in question.

**Private Camps.**

The various private camps in the City may be roughly divided into three classes :—

1. Those erected on sites provided by the Municipality for the various communities along the Sea Face, and at Cruikshank and Frere Roads.
2. Those erected on private land in F. and G. Wards in the North.
3. Municipal sites allotted to private individuals on the Vincent Road in the North of the Island.

Private camps were erected to a very much larger extent than ever before, and the following account of a Meeting of Representatives of different castes of the Dakshani Hindu Community held on 6th September 1898, shows how the movement originated, and gives the names of the gentlemen who took a special interest in its development :—

**Proceedings of a Meeting of Representatives of different  
Castes of the Dakshani Hindu Community,  
held on 6th September 1898.**

A preliminary meeting of representatives of different castes of the Hindu community was held in Shankarsett House on Tuesday, the 6th September 1898, at 5-30 P.M., to consider the advisability of erecting health camps for those castes, in view of the apprehended recrudescence of plague this year, and to adopt measures for the erection of such camps.

The Honourable Dr. Bhalchandra Krishna was called to the chair on the motion of Rao Bahadur Wasudev Jagannath Kirtikar, seconded by Rao Bahadur Dhakji Kashinathji.

The Chairman explained that the meeting had been called at the suggestion of Mr. W. L. Harvey, I.C.S., Acting Municipal Commissioner for the City of Bombay, who had conferred with some Members of the Corporation, and stated that it was time for the people of different communities to consider the advisability of constructing health camps, and that so far as practicable he (the Municipal Commissioner) would help them in the matter of suitable sites and the necessary sanitary and other requirements such as drainage, latrines, water and lighting ; that the arrangements for Maráthás, Telugus, &c., were entrusted to other members ; and that this meeting had to consider the measures for certain castes whose representatives had been called to meet there that day. The Chairman said that Mr. Harvey's suggestion was a good one, and that it would be eminently desirable to accept it as soon as possible. He further said that the Pathare Prabhu community had already begun work in this direction and were obtaining the requisite information for their own caste. In answer to a question whether the Municipality would also supply the Police required to guard the camps, the Chairman explained that this was a matter on which the Commissioner of Police would have to be consulted ; and that if a representation were made, he thought the Municipal and Police Commissioners would in all probability be willing to meet the wishes of the people.



Rao Bahadurs Kirtikar and Dhakji Kashinathji expressed their approval of what the Chairman said.

It was then proposed by Dr. Shantaram Vithal and seconded by Rao Saheb Narayan Trimbak Vaidya, that a Committee consisting of the gentlemen named in the list printed below be appointed, with power to add to their number, to ascertain how many members of their respective castes would be willing to remove to health camps constructing sheds at their own expense, and what sites they would consider suitable for the purpose, so that steps may be taken to secure the sites required. This proposition was carried unanimously.

Rao Bahadur W. J. Kirtikar proposed and Mr. Balkrishna V. N. Kirtikar seconded that—

Rao Bahadur Dhakji Kashinathji,  
Rao Saheb Narayan Trimbak Vaidya,  
Mr. Sundarnath D. Khoté, and  
Dr. Dadoba Janardan Mantri,

be appointed General Secretaries, and that they should obtain the required information from the Sub-Committees of different castes, consisting of the representatives of those castes on the General Committee and any other members of the caste whose names these representatives may consider necessary to add to their number. This proposition was also carried unanimously.

The Chairman in his concluding speech requested the representatives of each caste to immediately proceed to form themselves into Sub-Committees and to collect the requisite information as early as possible.

Votes of thanks to the Chairman for his able conduct in the chair and to Mr. Raoji V. J. Shankarseti for the use of his Hall for the meeting, terminated the proceedings.

BHALCHANDRA KRISHNA,  
*Chairman.*

#### *List of Members of the General Committee.*

Anandrao Harishankar, Esq.	Rao Saheb Ganpatrao M. Pitale.
Anandrao Vinayak, Esq.	Ganpat Sadashiv Rao, Esq.
Atmaram Jagannath Kirtikar, Esq.	Rao Saheb Ghanasham N. Nadkarni.
Balaji Narayan Bhise, Esq.	Gopal Moreshwar Sathe, Esq.
Balkrishna V. N. Kirtikar, Esq.	Dr. Govind Balaji Kher.
Bapuji Dinanathji, Esq.	Harischandra Baba Joshi, Esq.
The Hon'ble Dr. Bhalchandra Krishna.	Harischandra Jagannath Goregavkar,
Bhaskar Bhan Mantri, Esq.	Esq.
Rao Bahadur Bhaskerrao B. Pitale.	Harischandra Pandurangji, Esq.
Bhaskar Shivram, Esq.	Jagannath Narayan Parmanand, Esq.
Bhauram Raghoba, Esq.	Janardan Damodar Kolhatkar, Esq.
Dr. Bhawanishankar Balkrishna.	Janardan Gopal Mantri, Esq.
Dr. Dadoba Janardan Mantri.	Janardan Purushotamji, Esq.
The Hon'ble Mr. Daji Abaji Khare.	Janardan Raghoba Vanmali, Esq.
Damodar Ganesh, Esq.	Keshav Kushaba Acharya, Esq.
Dattatraya Narayan Vaidya, Esq.	Rao Bahadur Keshavrao Bhaskarji.
Rao Bahadur Dhakji Kashinathji.	Krishnarao Antoba Chemburkar, Esq.
Gangadhar Devji, Esq.	Krishnarao Ganpat Naik, Esq.
Gangaram Bapsoba Rele, Esq.	Lakshman Harischandra Chaudhri, Esq.
Ganpatrao Chintoba Chhapwale, Esq.	Madhavrao Shridhar, Esq.



*List of Members of the General Committee.—contd.*

Mahadev Rajaram Bodas, Esq.	Ramkrishna Lakshman Dolas, Esq.
Mahadev Bhaskar Chaulal, Esq.	Dr. Ramkrishna Narayan Parmanand.
Dr. Moreshwar Gopal Deshmukh.	Ramkrishna Purshotam Vaknis, Esq.
Nanabhai Moroba, Esq.	Raoji Vinayakrao J. Shankarsett, Esq.
Nanabhai Sadanand Kale, Esq.	Sadanand Trimbakji Kale, Esq.
Dr. Nanu Atmaram Tarkhad.	Shamrao Manekji Rele, Esq.
Nanu Narayan Kothare, Esq.	Shamrao Narayan Laud, Esq.
The Hon'ble Mr. Narayan G. Chandavarkar.	Shamrao Pandurang, Esq.
Narayan Mahadev Samarth, Esq.	Shamrao Vithal, Esq.
Narayan Raghunathji, Esq.	Shankar Damodar Godambe, Esq.
Rao Saheb Narayan Trimbak Vaidya.	Shantaram Narayan Dabholkar, Esq.
Narayan Vishwanath Mandlik, Esq.	Dr. Shantaram Vithal.
Nathuram Ananta, Esq.	Shivshankar Maloji Chavathe, Esq.
Pandurang Krishnaji, Esq.	Sitaram Dhakji Waslekar, Esq.
Purushotam Balkrishna Joshi, Esq.	Rao Saheb Sitaram Khanderao.
Purushotam Bandhuji, Esq.	Sundarnath D. Khote, Esq.
Purushotam Bahi, Esq.	Vaman Vasudev Muranjan, Esq.
Ragunath Mukund, Esq.	Vasantao Nana Moroba, Esq.
Ramchandara Balkrishna Mahadeshwar, Esq.	Vinayak Sadanad Joshi, Esq.
Ramchandra Harji, Esq.	Viswanath Dhondoba, Esq.
Ramchandra Manikji, Esq.	Wamanrao Damodar Pitale, Esq.
	Rao Bahadur Wasudev J. Kirtikar.

The following sites were allotted to various Committees :—

Parsee ... ..	Cruikshank Road ... ..	10,000 sq. yards.
Do.* ... ..	Kennedy Sea Face ... ..	13,414 "
Dāivadnya* ... ..	Cruikshank Road ... ..	2,853 "
Do.* ... ..	Kennedy Sea Face ... ..	3,734 "
Pathare Prabhu* ... ..	do. ... ..	11,743 "
Dakshni Brahmin* ... ..	do. ... ..	5,470 "
Somwashi Kshatrya* ... ..	do. ... ..	3,072 "
Gaud Brahmin* ... ..	do. ... ..	3,599 "
Kayasth Prabhu* ... ..	do. ... ..	1,867 "
Kshatrya* ... ..	do. ... ..	1,867 "
Yajoorwedi Brahmin* ... ..	do. ... ..	1,212 "
Lohana ... ..	Frere Road ... ..	1,786 "
Parsee ... ..	do. ... ..	3,478 "
Bhattia*... ..	Near Goculdas Tejpal Hospital...	30 rooms.

Of the camps mentioned above, those marked with an asterisk lay all fairly close together, and an Inspector was appointed to supervise their conservancy arrangements. The camps were erected at the expense of the various communities, in a few cases private individuals erecting huts for themselves. The Municipality provided latrine accommodation and washing places; and made arrangements for draining and lighting them: providing also a conservancy staff consisting of 21 men and one night-soil cart, and paying for the services of 12 police ramosis. The Parsees also had a special staff of conservancy coolies of their own. At the camps of the Parsee and Bhattia communities the privies and urinals were erected by themselves, and the lighting and

police arrangements were carried out at their own expense. Each camp was looked after by the Secretary of the Panchayat or Committee of Management. All cases of illness or of sudden death were reported to the Municipal Inspector, and in those huts where deaths occurred, the bedding and cast-off clothes of the deceased were burnt with the permission of the relatives as a precautionary measure. The huts being disinfected and vacated for 24 hours. In cases of undoubted plague, more stringent measures were taken.

The Parsees also had camps on Municipal land at Dadar and Matunga, besides the portion of the old Modykhana camp allotted to them for use partly as a camp and partly as a hospital; and they had camps or buildings on their own or private land in eight other places. The maximum number accommodated at these various places aggregated 2,413. Permission to occupy the sheds and rooms was at first given for one month only, but that period was enhanced when the quarters from which the inmates originally came continued to be affected. About  $\frac{1}{3}$ rd of the total number came from the Fort alone. A camp master was placed in charge of every camp, as well as honorary medical officers.

The number of Parsees who left Bombay during the year under report was less than in either of the preceding years, and yet the mortality among them during the year was smaller. This may not unreasonably be ascribed to the extensive arrangements for accommodating in camp families from infected localities made by the Parsee Panchayet and their energetic Secretary, Shams-ul-Ulama Jivanji Jamsetji Modi.

These arrangements cost about Rs. 23,000.

The Pathare Prabhu Camp was opened on the 4th November 1898, with accommodation for 325 persons. This was extended in February, so as to provide room for 840. This camp was exceedingly well managed under the personal supervision of Rao Bahadur Dhakji Kashinath. Strict camp regulations were drawn up and complied with. The camp was medically inspected morning and evening, outsiders were not allowed to sleep in camp, and other sound rules were laid down. In addition to the conservancy arrangements made by the Municipality, the community itself expended money in this direction, and, among other things, erected 12 temporary urinals for the use of women and children. Three suspicious plague cases occurred in this camp at intervals of 5, 9 and 12 days, respectively, after arrival in camp. They were all removed to hospital.

In the Gaud Saraswat Brahmin Camp one plague case occurred four days after arrival in camp, and was removed to hospital, and a plague death occurred one month after arrival. The person attacked was in the habit of visiting a house where dead rats were found. The camp was supervised by Rao Bahadur Ghanasham Nilkant Nadkarni, Rao Saheb G. M. Dukle, and Mr. V. G. Bhandarkar, and an honorary medical officer was also appointed.



The Daivadnya Camp on the Kennedy Sea Face was erected under the patronage of Rao Bahadur Bhaskerrao Balkrishnaji Pitale from a sum of about Rs. 1,000 raised by subscription. Five separate sheds were built for contacts, and their clothing, &c., was invariably disinfected. Contacts remained in camp from ten to twenty days, evicts for longer periods. There were no plague cases among the contacts, and only one suspicious case among evicts. The patient had been in Camp 38 days. Regarding the other Daivadnya Health Camp on the Cruikshank Road similar particulars are not available, nor have they been furnished regarding the Kshatrya and Somawashi Kshatrya Camps.

The Dakshani Brahmin Camp had 7 cases of plague,—5 among persons who had not been there more than 7 days, the other 2 had been there more than a month, but were in the habit of visiting their residences in a highly infected part of the town. Separate sheds were set apart for contacts.

In the Bhattia Segregation Camp there were also 2 plague cases among contacts admitted. One occurred on the day of arrival, one two days later. Dr. D. B. Naik was Secretary and Treasurer of the Yajoorwedi Brahmin Camp, and an honorary medical officer was appointed. Rao Saheb Sitaram Khanderao presided over the Kayasth Parbhu Camp, and volunteer visitors supervised its health and sanitation.

The Municipal Inspector also supervised a small camp for Government peons on the Kennedy Sea Face. This had been in existence since the end of 1896. At the end of March dead rats were found here, a plague death occurred, and 3 suffering cases were removed. The camp was then pulled down, and the occupants accommodated in the Municipal Camp adjoining, pending its re-construction.

The Lohana camp was erected on 1st February 1899. Those admitted, whether contacts or evicts, remained for at least ten days. A Lohana camp master was appointed by the community, and two police ramosis were supplied at Municipal expense to assist him. All clothing and bedding was daily exposed to the sun. Two plague cases occurred among evicts from infected houses, five and six days respectively, after arrival in camp.

Numerous applications were made by individuals for sites on which they might erect temporary quarters, and this demand was met by allotting sites, by the permission of the Bombay Improvement Trust, on the open land on either side of the Vincent Road. In all about 200 sheds were put up by private individuals, all of a respectable position. Sheds were also put up here by the Bombay Gas Company for their office staff, by the Kohinoor Mill Company for their hands, and by Messrs. K. J. Rustomji and Company for their office staff. In these camps and huts the people erected their own privies, but conservancy staff was provided by the Municipality. The Municipality also erected stand-pipes, and supplied water. Some thirty sheds originally constructed by Rao Baha-



dur Ellapa Balaram, were placed in his charge to repair and allot to applicants. The Parsi Community also repaired and made use of some previously erected sheds, making their own arrangements for washing-places and privies.

The open land and paddy fields in the North of the Island, belonging to private individuals, were utilised to a very large extent for the erection of temporary quarters. Associations of individuals settled down together in various spots, and the residents of the suburbs erected huts to a considerable extent in open land adjoining their houses. Six small Municipal camps were also erected in various places, and the accompanying statement shows that a more or less permanent population of nearly 40,000 people was thus camped out. In most places, where there was any considerable collection of people, special water and latrine arrangements were made by the Municipality, a considerable staff of halalkhores and sweepers was employed; a few police ramosis were also engaged for the security of property.

**Construction  
and Manage-  
ment of Public  
Camps.**

The public camps were made of sheds constructed with bamboo posts, roofs either of double bamboo matting or cadjans, and walls of bamboo matting. Corrugated iron was used for the roofs in one or two special cases. The floors were of earth or murram. Latrine accommodation was provided, as also standpipes, with paved platforms, for washing purposes, and drainage and cesspool arrangements. The camps were lighted with kerosine oil lamps. At the Byculla Camp, a prayer shed was also put up, and large mandaps for the Julahi weavers to work in. The extent to which latrine, washing and similar arrangements were provided by the Municipality at the private camps has already been indicated. The whole brunt of this very heavy work fell upon the Executive Engineer's Department. It was carried out with practically no extra staff, and plague operations were never hampered by delay in their execution. These results could not have been achieved without the most cordial and loyal co-operation of the Executive Engineer, Khan Bahadur M. C. Murzban, C.I.E., and Messrs. James and Fairlie Bruce, in charge of the Drainage and Water Works Departments. This opportunity is taken by the Commissioner of recording his hearty appreciation of their services. A special word of praise is due to the Architectural Surveyor, Mr. Govindram, upon whom fell the task of erection of almost all the Municipal camps and hospitals.

The segregation of those persons who from contact with the sick are very possibly plague-stricken, although they have not as yet manifested any outward symptoms, has long been recognised as an important point in plague administration. Such persons are called contacts. When the recurrence of plague has proved a house or locality to be thoroughly infected its vacation is one of the few measures which popular opinion, educated by individual experience, supports. The people turned out are called evicts. Camps are erected to provide accommodation for these two classes.

It has been thought advisable in the past to keep contacts entirely separate from all other people: this could only be done by stringent quarantine regulations. They were enforced, but their stringency defeated their object, and practically no contacts could be found to segregate. At the beginning of the year under report, it was decided on account of this consideration to relax these quarantine regulations almost entirely; and practically speaking contacts have been treated in precisely the same way as evicts. They have been more rigorously disinfected, they have been quartered in a separate portion of the camp, and district officers have been impressed with the necessity of sending with them their household goods in order that the camp master may have some control over them. They were expected to sleep in camp, and roll-call was held to see whether they did so, but during the day they were allowed to go to and from camp with absolute freedom. The camp master had ramosis to assist him, and almost the only check upon them was that they were not allowed to take away their cooking pots and furniture till their time was up. In almost all the few cases that were brought to notice of contacts leaving camp, *i.e.*, failing to sleep there, without permission, they were traced and brought back to complete their time. The people in camp were kept under close supervision in regard to their health; plague when it occurred among them was almost always detected in its earliest stages; the patient was at once sent off to hospital, his hut unroofed, disinfected and kept unoccupied for at least 10 days; and these precautions were so successful, that in none of the various Municipal camps, crammed as they were with people from the most highly infected localities in Bombay, did plague ever appear in epidemic form: and it hardly ever occurred that there was any suspicion that one person might have got plague from another in camp. The people in camp were allowed to go about their ordinary avocations; but in the cases where, owing to the sickness of the bread-winner, the distance of the camp from the place of work, or other cause, the occupants were distressed, they were helped from the Discretionary Relief Fund in the hands of the district or other officers. The same fund bore the expense of their removal to camp. Ordinarily people were kept in camp for 10 days, but when the localities they came from continued seriously infected, or their houses were not ready for re-occupation, the period was extended; and, on the other hand, when at the height of the epidemic the pressure upon the available accommodation became extreme, the officers in charge were authorised to reduce the period, if absolutely necessary, to a minimum of 3 days. The following further account of the camps in C Ward is given by Lieutenant Warneford:—

“ On arrival in camp the people’s clothes, bedding, boxes and other furniture  
 “ were thoroughly disinfected and then placed in the sun. This disinfection was  
 “ carried out by a special gang which went round to each of the three camps once  
 “ a day, and it was also the duty of this gang to disinfect all huts in the camps that  
 “ had been vacated on the discharge of their occupants, so that the huts might be  
 “ perfectly clean and healthy on the arrival of fresh occupants. The clothing and



“ bedding of all occupants of the camps was also required to be spread in the sun daily from 11 a.m. to 1 p.m. Contacts and evicts were kept in opposite quarters of the camps, and every resident in the camp was inspected daily by the Visiting Medical officer, who also specially examined all people newly admitted or who were to be discharged. The three camps for the use of the ward were the Gokuldas Tejpal, Charni Road and Crawford Market, and they consisted of altogether 950 huts, accommodating about 3,500 people. They were completely full on several occasions and were of the greatest use in enabling us to empty infected rooms or houses. Between September and the middle of May over 200 complete houses were vacated by the direct action of the District Officer and the occupants removed to these camps, and probably more than double that number of houses inhabited by persons of the higher classes were vacated voluntarily by their occupants on the advice or persuasion of the District Officer, aided by the Volunteers. In these latter cases the occupants were allowed to go where they wished.”

The above description applies with slight variations to all the other Municipal camps. At two of them—the Narielwadi and Byculla camps, the process of disinfection was greatly facilitated by the use of the Sterilizers set up in them. In some cases strong carbolic soap or phenyle was given to the people to wash themselves with, and sometimes they were again disinfected before leaving camp. Blankets also were served out to those who felt the cold, being returned, except where the people were extremely poor, when they left camp. In a few cases cots were supplied where the ground was damp and the inmates had none of their own. A careful register was invariably kept of all arrivals and departures, cases of sickness and other particulars.

It has been mentioned that at the Julaha camp, Byculla, a shed for prayer and accommodation for their handlooms was provided. Every consideration was given to their habits and prejudices, and camp life was made for them as comfortable as possible. The popularity of this camp increased so much, that when rats were dying or plague cases occurring in a chawl, the people themselves often asked to be removed there. The Julahas signified their approval of this camp by changing its designation from “Karanteen” to “Karamteen.” The word “Karam” means “kindness”. People constantly left the various camps with the greatest reluctance. Applications from outsiders for permission to reside in them throughout the fair weather at any reasonable rent had over and over again to be refused, and one of the greatest difficulties met with in regard to the management of camps was that of getting rid of tenants who had been permitted to reside in some of them through the monsoon on payment of rent. All camps were supervised by camp masters, provided with latrine and water arrangements, and drainage where necessary. There was also a staff of sweepers and halalkhores to attend to conservancy; and police ramosis to assist the camp master and look to the security of property. It only remains to mention that between 1,000 and 2,000 people in E Ward erected huts in convenient open spaces for themselves, and as in the case of the huts in F and G Wards, they were left to themselves. A little assistance was occasionally given to them in putting up their sheds.



Population in  
Camps.

The accompanying statements show—

(1) The number of contacts and evicts passed through the various camps under Municipal control.

(2) The number passed through the camps or other accommodation attached to various hospitals—public and private.

(3) The number passed through various private camps.

(4) The number permanently accommodated in camps and hutments in the North of the Island.

STATEMENT I.—Showing the number of Contacts and Evicts passed through Health Camps under Municipal Control from 9th October 1898 to 31st May 1899.

Names of Camps.		Number of huts.	Last Re- Mained	Admit- ted.	Trans- ferred.	Dischar- ged.	Died.	Remain- ing.
Elphinstone Bridge Camp.	{ Contacts Evicts }	132 {	57 383	315 4,590	8 17	350 4,531	1 19	13 376
Gokuldas Tejpal Camp.	{ Contacts Evicts }	302 {	21 627	2,206 2,444	18 28	2,138 2,956	10 20	61 67
Sankli Street Camp...	{ Contacts Evicts }	45 {	... 94	... 48	... 3	... 6	... 9	... 124
Wari Bunder Camp...	{ Contacts Evicts }	160 {	288 ...	1,798 2,644	72 38	1,938 2,560	... 5	76 41
Narielwadi Camp ...	{ Contacts Evicts }	145 300	68 235	5,541 1,082	88 9	5,495 603	19 29	7 676
Balaram Camp ...	{ Contacts Evicts }	136 {	16 138	567 3,326	17 8	560 3,154	1 7	5 295
Byculla Camp ...	{ Contacts Evicts }	388 470	... 275	... 7,378	... 313	... 7,184	... 39	... 117
Vithal Sayana Camp.	{ Contacts Evicts }	47 {	... ...	775 624	20 26	708 536	1 2	46 60
Cruikshank Road Camp.	{ Contacts Evicts }	60 {	... ...	434 564	3 ...	415 549	1 ...	15 15
Gilder Street Camp...	{ Contacts Evicts }	100 {	... ...	442 3,561	16 14	422 3,332	2 5	2 210
Kennedy Sea Face Camp.	{ Contacts Evicts }	464 {	... ...	827 3,034	20 27	796 2,859	11 17	... 131
Byculla Mahar Camp.	{ Contacts Evicts }	250 {	... ...	... 1,672	... 59	... 1,599	... 14	... ...
Crawford Market Camp.	{ Contacts Evicts }	182 {	... ...	654 2,549	8 34	644 2,503	2 12	... ...
Babula Tank Camp...	{ Contacts Evicts }	29 {	... ...	... 301	... ...	... 301	... ...	... ...
Ghorupdeo Camp ...	{ Contacts Evicts }	180 {	... ...	607 2,218	8 13	559 2,167	2 6	38 32
Umerkhadi Camp ...	{ Contacts Evicts }	Pera lene 12 Jail Road 21	... ...	... 762	... 9	... 727	... ...	... 26
Northbrook Garden Camp.	{ Contacts Evicts }		41 {	... ...	... 69	... 4	... 65	... ...
Arthur Road Dhobi Camp.	{ Contacts Evicts }	50 {	... ...	... 132	... 1	... 113	... 3	... 15
Narielwadi Mahome- dan Camp.	{ Contacts Evicts }	60 {	... ...	... 283	... ...	... 268	... 15	... ...
Grant Road Camp ...	{ Contacts Evicts }	55 {	... ...	... 642	... ...	... 593	... 9	... 40
Chowpatti Camp ...	{ Contacts Evicts }	100 {	... ...	... 583	... ...	... 572	... 7	... 4
Total ...	{ Contacts }	3,729 {	450	14,166	278	14,025	50	263
	{ Evicts }		1,752	38,506	603	37,208	218	2,229

STATEMENT II.—Showing the number of Contacts and Evicts passed through camps or other accommodation attached to Hospitals—public and private—from 9th October 1898 to 31st May 1899:—

Name of Hospital.		Last Re- mained.	Admitted.	Trans- ferred.	Discharg- ed.	Died.	Remain- ing.
Arthur Road Hospital.	{	Contacts...	511	1	495	...	15
		Evicts ...	...	...	...	...	...
Modikhana Hospital...	{	Contacts...	7	174	2	177	2
		Evicts ...	...	...	...	...	...
Maratha Hospital ...	{	Contacts...	57	2,001	...	2,038	...
		Evicts ...	4	291	...	295	...
Mahomedbhoy Ebrahim Hospi- tal. ... ..	{	Contacts...	4	27	...	31	...
		Evicts ...	...	...	...	...	...
Dariasthan Lohana Hospital.	{	Contacts...	...	118	1	91	...
		Evicts ...	...	...	...	...	...
Port Trust Hospital...	{	Contacts...	7	193	...	181	...
		Evicts ...	...	154	...	130	...
Jain Hospital Pinjrapole. ...	{	Contacts...	7	91	75	19	...
		Evicts ...	...	...	...	...	...
General Mahomedan Hospital.	{	Contacts...	...	221	...	195	14
		Evicts ...	...	73	...	73	...
Thakurdwar Lohana Hospital.	{	Contacts...	...	11	...	11	...
		Evicts ...	...	...	...	...	...
Ada m ji Peerbhoy Hospital.	{	Contacts...	...	111	...	81	...
		Evicts ...	...	...	...	...	...
Julai Sunni Hospital	{	Contacts...	16	426	4	433	...
		Evicts ...	...	...	...	...	...
Bene-Israel Hospital	{	Contacts...	...	134	1	111	...
		Evicts ...	...	69	...	69	...
Jain Hospital, Parel...	{	Contacts...	...	247	1	235	8
		Evicts ...	...	...	...	...	...
Telugu Hospital ...	{	Contacts...	7	123	1	129	...
		Evicts ...	...	...	...	...	...
Stuart Strong Hospital.	{	Contacts...	...	38	...	38	...
		Evicts ...	...	...	...	...	...
Pathare Prabhu Hospital.	{	Contacts...	...	4	...	4	...
		Evicts ...	...	...	...	...	...
Sarvajani Hospital...	{	Contacts...	...	11	...	11	...
		Evicts ...	...	...	...	...	...
Petit Mills Hospital...	{	Contacts...	...	45	...	45	...
		Evicts ...	...	...	...	...	...
Bhois' Hospital ...	{	Contacts...	...	20	...	20	...
		Evicts ...	...	...	...	...	...
Kshatriya Hospital...	{	Contacts...	...	12	...	12	...
		Evicts ...	...	...	...	...	...
Vasunji Trijumji Hospital.	{	Contacts...	...	17	...	16	...
		Evicts ...	...	...	...	...	...
Hindu Fever Hospital	{	Contacts...	...	39	...	39	...
		Evicts ...	...	...	...	...	...
Brahma Kshatriya Hospital.	{	Contacts...	...	1	...	1	...
		Evicts ...	...	...	...	...	...
Total ... ..		Contacts...	105	4,575	86	4,413	24
		Evicts ...	4	587	...	567	...
Add total of contacts and evicts in camps ... ..		Contacts...	450	14,166	278	14,025	50
		Evicts ...	1,752	38,506	603	37,208	218
Grand Total ... ..		Contacts...	555	18,741	364	18,438	74
		Evicts ...	1,756	39,093	603	37,775	218

Statement III.—Showing the number of persons who passed through various private camps.

Name of Camp.								Number of people passed through Camp.
<i>Private Camps.</i>								
1	Parsi Camp at Cruikshank Road	...	...	...	...	...	366	
2	Do. do. Marine Lines	...	...	...	...	...	554	
3	Do. do. Chowpati	...	...	...	...	...	227	
4	Do. do. Batliwala's Wadi	...	...	...	...	...	75	
5	Do. do. Balliwala's Wadi	...	...	...	...	...	77	
6	Do. do. Hormuz Bāg...	...	...	...	...	...	38	
7	Do. do. Kama Bāg	...	...	...	...	...	215	
8	Do. do. Churney Road	...	...	...	...	...	76	
9	Do. do. Modikhana	...	...	...	...	...	573	
							2,201	
10	Daiwadnya Health Camp at Cruikshank Road	...	...	...	...	...	323	
11	Do. at Kennedy Sea Face Nos. I and II	...	...	...	...	...	236	
12	Bhatia Health Camp near G. T. Hospital	...	...	...	...	...	131	
13	Dakshini Brahmin Health Camp	...	...	...	...	...	284	
14	Somwanshi Kshatriya	...	...	...	...	...	141	
15	Goud Saraswat Brahmin	...	...	...	...	...	313	
16	Pathare Prabhu Camps	...	...	...	...	...	886	
17	Chandraseniya Kayastha Prabhu	...	...	...	...	...	148	
18	Khatri Health Camp	...	...	...	...	...	60	
19	Palshe Brahmin	...	...	...	...	...	27	
20	Secretariat Offices Health Camp	...	...	...	...	...	210	
21	Lohana Health Camp	...	...	...	...	...	124	
Total							2,883	

STATEMENT IV.—Showing the number of people permanently accommodated in camps and hutments in the north of the Island:

Name of Camp.								No. of occupants.
<i>Vincent Road Camps.</i>								
West side of Vincent Road	...	...	...	...	...	...	3,030	
East side	"	"	...	...	...	...	990	
Dadar (between Railway Lines)	...	...	...	...	...	...	2,240	
Matunga	...	...	...	...	...	...	2,430	
Vincent Road (Bhoiwada and Naigam)	...	...	...	...	...	...	2,000	
DeLisle Road	...	...	...	...	...	...	600	
Sion (Agriwada, Koliwada, Buidarwada)	...	...	...	...	...	...	2,000	
Rowli Hill	...	...	...	...	...	...	400	
Huts in wadis in Parel	...	...	...	...	...	...	240	
Wadalla	...	...	...	...	...	...	840	
Goveri	...	...	...	...	...	...	350	
Sivri (Koliwada and Agriwada)	...	...	...	...	...	...	1,320	
Sivri	...	...	...	...	...	...	700	
Worli Koliwada	...	...	...	...	...	...	3,500	
Pakhadi and Pakhadi Road	...	...	...	...	...	...	1,000	
Pumping Station and Marwada	...	...	...	...	...	...	300	
Dharawi	...	...	...	...	...	...	250	
<i>Mahim Camps.</i>								
Main Road Koliwadi	...	...	...	...	...	...	1,500	
Ladv. Jamsetji Road, Bhandarwada	...	...	...	...	...	...	500	



## Statement IV (continued.)

Name of Camp.							No. of occupants.
<i>Dadar Camps.</i>							
Agar Bazar Church Road	...	...	...	...	...	...	1,200
<i>Hansaly Tank and Husan Village.</i>							
Mahim Bazar Road and Bhandarwada	...	...	...	...	...	...	2,000
Dadar Kumbharwada	...	...	...	...	...	...	800
Palkhiwadi and Causeway huts	...	...	...	...	...	...	900
Govindji's Camp	...	...	...	...	...	...	800
Mahomedan and Weavers' Camp	...	...	...	...	...	...	200
Girgaum Camp	...	...	...	...	...	...	100
Hate's Camp	...	...	...	...	...	...	150
DeMonte's Oart	...	...	...	...	...	...	200
Total						...	30,540
<i>Municipal Huts.</i>							
Elphinstone Road	...	...	...	...	...	...	320
Dadar Station	...	...	...	...	...	...	215
Worli Koliwada	...	...	...	...	...	...	320
Mahim Huts	...	...	...	...	...	...	190
Worli Pakhadi	...	...	...	...	...	...	185
Total						...	1,230

The total of persons passed through the camps, &c., referred to in statements I and II should correspond with the total of columns 7 and 10 of the statement on page 42 showing the total number of contacts and evicts sent to camp.

There is practically no discrepancy in regard to contacts, but against 54,252 evicts, shewn as sent to camp from 9th October to 27th May 1899, only 39,093 are shewn as admitted into the camps. This difference of 15,159 is explained as follows :—

Practically all the 6,947 persons sent to camp in F and G Wards, went to the permanent camps and hutments shewn in statement IV., similarly about 2,000 of those shown as evicts in E Ward went into temporary huts erected on open spaces near their chawls, and another 1,000 went into private camps, &c., elsewhere in the city. The remaining 5,212 roughly represents the number who, when turned out and on their way to camp, bolted to other parts of the city.

#### Plague in Camps.

The following account of the 3 Municipal camps in C Ward is given by Dr. P. J. de Souza, who was appointed to medically supervise them :—

I was in medical charge of the Charni Road, Goculdas Tejpal, and Crawford Market Camps from February up to the end of May 1899 and during that time I had frequent and ample opportunity of noticing how they were managed, and to what extent they fulfilled the purpose for which they were erected. Each camp consisted of several rows of huts, each row containing on an average 3 blocks of huts, each hut

being about 10 feet long and 10 feet broad. In the Crawford Market camp, the space between the rows of huts was not so large as in the other two Camps and might have been widened with advantage. The huts could each give comfortable accommodation to about 5 persons, and were light, airy, clean, and generally sanitary. The water and conservancy arrangements were adequate, the only complaints received being about occasional bad smells from the latrines, and in the Charni Road Camp also from the cesspools. Each camp was under the direct supervision of a Camp Master, who had a staff of subordinates and servants under him. His duty was principally to keep a register of arrivals and departures, and to go round the camp morning, noon and night every day to see that everything was in order.

The people who occupied the camps were divided into 2 classes ; contacts and evicts. These were sent in by the Sectional Medical Officers, in charge of a contact Inspector. On arrival at the camp, the Camp Master took down and registered the names of all the persons, and then assigned to them the huts in which they were to live. Their clothes and belongings were thoroughly disinfected and personal cleanliness was strictly insisted on. Contacts and evicts were kept in separate rows of huts to prevent the possibility of the latter being infected by the former.

Contacts and evicts alike were detained in camp for eleven days, and were generally discharged on the 12th. An exception was made in the cases of people whose houses were not ready to receive them back, or when the places in which they usually lived continued to be infected. These were allowed to stay on, and such as could pay were charged rent for the period of their stay in excess of 15 days at the rate of Rs. 2 per hut per mensem. Many found life "in camp" so desirable and so preferable to their usual surroundings that they begged to be allowed to stay for longer periods, offering to pay even a higher rental than the nominal one charged. It was not, however, possible to meet the wishes of these applicants as the camp accommodation was necessarily limited and room had to be found or made for numerous fresh arrivals every day.

Some plague cases occurred in the 3 camps visited by me, and full particulars of these, as far as possible, were given in my periodical reports to the District Plague office of the C. Ward. A careful consideration of these cases seems to shew that in most of them—in almost all where the previous "history" of the patients could be traced—the source of infection lay outside the camp, either in their previous residences or surroundings, or in the places visited by them for purposes of business or pleasure during the time they were residents of the camps. The majority of the cases occurred among low-class Ghatees, who, by their habits and mode of life were much less immune to the plague infection than other classes, and who, when they caught the disease, generally had it in a more or less virulent and fatal form. I may here state that the huts in camp in which any case of plague occurred, were promptly lime-washed and disinfected, and afterwards kept vacant for ten days at least.

On the whole it seems to me that these camps met a great want in a manner that was altogether satisfactory. "Segregation" lost much of its terrors for the people at large when they saw that, as far as the camps went, it only meant a short change, free of cost, into better, livelier and cleaner quarters. In the camps they met with most considerate treatment and were not subjected to any irksome regulations, and they were free to spend the day time where and as they pleased. Better surroundings soon proved their value in the much reduced death-rate, for though the inmates of these camps came from all parts of Bombay and spent all day in various quarters of the city, nearly all highly infected localities, yet the percentage of deaths and plague cases in the camps was very small. These camps also helped to improve the condition of the localities from which their inmates came, by relieving the congestion

in thickly-populated districts, by allowing houses to be effectively cleaned out, aired and disinfected, and by minimising in them the facilities for the spread of infection. It was also noticeable that the general health of the inmates was good; remarkably so in fact, if we remember the conditions under which the people had shifted into these quarters, and that they had to endure certain discomforts inseparable from sudden change from a regular residence into a temporary one.

I append a tabular statement showing the dates of erection of the three camps abovenamed, the accommodation each provided, the number of arrivals, discharges and balances, and of plague attacks and deaths both among contacts and evicts between January and May 1899.

Statement relating to the Charni Road, Goculdas Tejpal and Crawford  
Market Health Camps.

Camp.	When erected.	No. of huts.	Month 1899.	Arrivals.		Discharges.		Balance.		Attacks of Plague.		Deaths from Plague.		Contacts and Evicts.	Total of arrivals from 1st Jan. to 31st May 1899.	Total of Plague attacks from 1st Jan. to 31st May 1899.	Total No. of Plague deaths from 1st Jan. to 31st May 1899.	Percentage of Plague attacks.	Percentage of Plague deaths.
				C.	E.	C.	E.	C.	E.	C.	E.	C.	E.						
Charni Road	17-12-1898.	465	From Jan. to Feb.	400	2,224	224	952	176	1,272	9	8	2	8	C E E E E	785	18	6	2.29	.76
			March	274	433	95	665	335	1,040	7	9	2	2						
			April	91	402	268	843	178	599	2	5	2	1						
			May	20	85	193	553	Nil.	131	..	1	..	..						
Goculdas Tejpal	23-2-1898	302	From Jan. to Feb.	1,273	2,404	851	1,551	422	853	11	17	1	6	C E E E E	1,947	17	6	.87	.30
			March	292	197	305	165	410	855	4	6	2	1						
			April	179	187	212	150	377	922	1	1	2	..						
			May	202	54	518	909	61	67	1	2	Nil	2						
Crawford Market.	11-1-1899	181	From Jan. to Feb.	175	1,410	4	1,021	171	289	1	9	1	2	C E E E E	605	8	1	1.32	.16
			March	243	333	189	384	225	338	5	6	..	3						
			April	124	444	251	437	118	345	2	5	..	..						
			May	63	138	181	483	Nil.	Nil.	Nil.	4	..	..						
Total of Contacts and Evicts															11,648	118	38	150	22

\* Actually in Camp, not in Hospitals.

Of the 116 attacks and 38 deaths, or a total of 154 plague cases—

8 occurred on the day of arrival.

13 on the following day.

12 after two days.

11 „ three „

7 „ four „

9 „ five „

4 „ six „

5 „ seven „

5 „ eight „

4 „ nine „

12 „ ten „

31 between ten and twenty days after arrival.

33 after an interval of more than twenty days.



Dr. DeSouza writes:

"In the great majority of these cases, it is impossible to say exactly where the patients caught the infection. It must be remembered that all the occupants of the camps came from infected houses, or had been in contact with plague patients. The infection may therefore often be traced to their last residence or occupation, as, in my opinion, the period of incubation may extend to 10 or 12 days. On the other hand, many of the people only used the camps as a place to sleep in at nights, and were for the rest of the time at work, or moving about possibly infected quarters of the town, and may have caught the disease (and probably did) outside the camps."

The following notes of Dr. DeSouza, about some of the patients who had been in camp for a considerable period before they were affected, may be of interest :—

1. Patient attacked 12 days after arrival.

Never left the camp, but probably retained the infection from her brother, who died 12 days before.

2. Patient attacked 13 days after arrival.

Was in attendance on a sick relative at Duncan Road, where he spent the whole day, only sleeping in the camp at nights. Probably infected at Duncan Road.

3. Patient attacked 15 days after arrival.

This woman never left the camp, but she used to visit one Jambhai Rajoo, who lived in hut No. 150. The latter took ill with plague 3 days before and was removed to hospital and probably gave the disease to this woman.

4. Patient attacked 15 days after arrival.

Was one of the disinfecting and limewashing cooly gang and may have caught the disease at work.

5. Patient attacked 16 days after arrival.

On the 6th February at about 11-30, while on my rounds, I saw one Govind Ramji sleeping in one of the huts No. 95, and on enquiring was told by him that he had attended some religious ceremony at Mahadeo Gully on the previous night, and that he was sleeping because he had lost a night's rest. I could find no suspicious symptoms. On the 8th I found at noon, that this man had suddenly developed grave symptoms such as high fever and delirium and had died at 11-30 A.M. From the suddenness of the symptoms and from the appearance of the corpse, I should say the cause of death was plague, which he may have got at the religious ceremony which he attended on the 5th, as his immediate surroundings at the Health Camp were clean.

6. Patient attacked 16 days after arrival.

This woman lost a son and a daughter from plague 17 and 4 days before, respectively.

7. Patient attacked 19 days after arrival.

This man, who worked every day at the Byculla Educational Press, was about to leave for his native country, but suddenly died of plague. On enquiries I find that this man used to conceal himself in the privy at the time of my visits. I found he had a bubo in the right groin, and from his general appearance the disease must have been two or three days old.

## 8. Patient attacked 22 days after arrival.

This man, though admitted here on the 31st January, did not live in the huts, but with some tailors in the Army and Navy Stores godown in the Fort. He was employed in the General Post Office, where I understand there had been some cases of plague. Pinto probably took the infection either in the godown or in his office and only came to the Health Camp on the 19th February, when he felt unwell. As the symptoms became aggravated and suspicious, I directed his removal to hospital, where he died, on the third day after admission, of plague.

## 9. Patient attacked one month after arrival.

(a) Took ill at a dinner party which he attended at Kumbharwada.

(b) This man, father of above, with his family, had been to Kumbharwada to attend a dinner party, from which his son returned with plague, dying the following morning; both father and son were probably infected in common, or perhaps the former caught the disease from the latter.

## 10. Patient attacked one month and 11 days after arrival.

This woman worked during the day as a cooly at Mandvi, which is an infected quarter. She probably caught the disease there, as she returned to the camp one day feeling ill with strong fever and delirium—died the next morning at about 4 A.M.

## 11. Patient attacked one month and 12 days after arrival.

This woman used to work at grinding corn in Bhoiwada, which is an infected quarter. Left the camp in the morning, feeling quite well, returned at 11 A.M. with strong fever, delirious, and died at 12-30 P.M.

## 12. Patient attacked 2 months and 5 days after arrival.

Cooly working in an infected quarter of the city. A room mate of his was also attacked with plague 9 days before.

The following statement shows the number of plague cases that occurred among the contacts and evicts in the camps mentioned—classified according to the interval between arrival in camp and attack.

How many days after admission.	Vittal Sayana.		Cruiksbank.		Elphinstone Bridge.		Grant Road.		Chowpatty.		Narielwadi.		Wari Bandar.		Ghorupdeo.		Ellapa Balaram.		A. R. Dholi.		Byculla.		Babula Tank.		Piru Lane		Total.
	C.	E.	C.	E.	C.	E.	C.	E.	C.	E.	C.	E.	C.	E.	C.	E.	C.	E.	C.	E.	C.	E.	C.	E.	C.	E.	
Same day	...	1	...	...	...	...	...	...	...	...	1	...	12	4	...	...	...	...	...	...	...	6	...	...	...	...	24
1	...	1	...	...	2	...	...	...	...	...	3	4	6	4	3	...	10	2	...	...	5	7	...	1	...	...	50
2	...	2	...	...	5	...	...	...	...	...	8	5	6	1	...	12	4	...	...	...	3	11	...	...	...	...	61
3	...	...	...	...	...	...	...	...	...	...	8	2	8	4	...	1	3	3	...	...	2	7	...	1	...	...	43
4	...	1	...	...	1	...	2	3	...	1	5	...	4	3	...	1	5	...	3	...	...	2	...	...	...	...	29
5	...	1	...	...	1	...	...	...	...	...	1	2	7	1	...	3	...	...	...	...	1	7	...	...	...	...	26
6	...	...	...	...	1	...	1	...	...	...	...	...	...	3	...	1	1	2	...	...	2	8	...	...	...	...	22
7	...	3	...	...	1	...	...	...	...	...	...	...	...	...	1	2	1	...	1	...	2	8	...	...	...	...	20
8	...	...	...	...	...	...	...	...	...	...	1	...	...	2	...	1	...	1	...	...	1	6	...	...	...	...	12
9	...	...	...	...	...	...	...	...	...	...	1	...	1	1	1	...	1	...	...	...	1	1	...	...	...	...	10
10	...	2	...	...	...	...	...	...	...	...	...	...	1	2	...	1	2	...	...	...	...	4	...	...	...	...	15
11 to 20	...	3	...	...	2	...	1	...	...	...	2	...	4	1	1	...	2	2	...	2	3	11	...	...	...	1	35
Over 20	...	1	...	...	2	3	...	1	...	...	1	...	...	1	...	1	1	...	...	...	...	11	...	...	...	...	22
Total	5	21	3	...	8	16	1	4	...	1	31	13	49	27	8	7	39	18	...	6	20	89	...	2	...	1	369



No cases occurred in the Northbrook Gardens or Jail Road camps.

Thirteen cases, all within ten days of arrival in camp, occurred in the Municipal huts in F and G Wards.

Adding the cases in the C ward camps and the 13 cases in F and G Wards, it will be observed that out of a total of 536 plague attacks among contacts and evicts in camp, all but 121 or practically 80 per cent. occurred within 10 days of arrival.

## CHAPTER VI.

**Discretionary Relief.****Discretionary Relief Fund.**

On 17th November 1898 Government in their Resolution  $\frac{6294}{6403-P}$  made known that the Government of India had sanctioned a grant for the Bombay Presidency of 3 lakhs of rupees for expenditure on "Discretionary Relief" to be incurred in the form of grants placed at the disposal of selected officers under the authority of the Government of Bombay. Of this amount one and-a-half lakhs were reserved provisionally for the City of Bombay. Government Resolution  $\frac{6230}{6328-P}$ . General Department (Plague), dated 14th November 1898, a copy of which is here inserted, indicates the objects with which this Fund was constituted, and the rules laid down for its administration.

*Plague.—*

Finance.

Grant of Discretionary Relief Funds.

General Department (Plague).

Bombay Castle,

No.  $\frac{6230}{6328-P}$ .

14th November 1898.

## RESOLUTION OF GOVERNMENT.

With a view to encourage the prompt reporting of cases of plague and to facilitate and popularise as far as possible the measures undertaken with the object of reducing mortality during the epidemic, Government are desirous of—

- (1) making the hospitals attractive,
- (2) removing the minor discomforts and losses attendant upon measures of disinfection, &c., and
- (3) removing the objections to temporary removal from an infected house or locality.

2. If there is any dislike or distrust of hospitals, cases will be concealed and opposition to removal will revive. Large numbers of hospitals have been opened both by local authorities and by caste committees, and most of them have been well maintained, but at present some lack those attractions which would cause patients and their friends to regard them with gratitude. As the severity of the epidemic increases, the strain on the benevolence of some of the poorer communities intensifies. It is unnecessary here to enumerate the ways in which the sufferings of the poor may be mitigated, but some may be mentioned, as for example, the provision of extra rations before discharge, the gift of clothing or small sums of money on discharge, the payment of funeral expenses, the support of the family where necessary, during illness or interruption of ordinary avocations, assistance to survivors or convalescents to return to their homes, and so forth. The popularity of hospitals will be enhanced by fairly generous treatment of the sick and their relations. Occasionally it may be useful to engage or subsidise popular hakims or native practitioners to attend the hospitals. No person who objects should be compelled to take medicines. It will be found sufficient to publish the results in the case of persons who have accepted and persons who have refused treatment.

3. Concealment of cases is also practised in order to avoid the inconveniences and petty expenses of disinfection, destruction of clothing, &c. Here also much can be done to remove the objections of the poor and to gain at least their acquiescence. Government fear that too little attention has been given to the payment of prompt compensation and to the grant of a trifling sum to cover, in the case of the working classes, the petty expenses incidental to a temporary vacation of the house. Compensation for articles destroyed or damaged must be paid by the officer on the spot and may be calculated not only with regard to the value of the article, but also with regard to the cost of replacing it.

4. The objections to the temporary removal to a camp are usually of a similar nature. The removal involves interruption to work or the loss of wages or exposure of children to cold, or expenses of transit, and so forth. This is particularly the case with weavers. The officer must make careful inquiry in each case and use his discretion how far to afford relief.

5. The class of expenditure which has been indicated in the foregoing paragraphs may be described as Discretionary Relief. The Plague Commissioner, subject to the sanction of Government, will place distinct sums from time to time at the disposal of particular officers, Civil or Military. The officer concerned will report weekly the amount spent and the place where he has spent it, and the countersignature of the Plague Commissioner will be accepted by the Accountant-General as a sufficient voucher for the expenditure. Subject to the sanction of Government in each case, the Plague Commissioner may also subsidise any hospital which he is satisfied is in need of such assistance.

6. In Bombay City the Plague Commissioner is authorized to place a sum at the disposal of the Municipal Commissioner and elsewhere at the disposal of the Collector of the District where such assistance appears to the Plague Commissioner to be necessary. This money must be regarded as quite distinct from advances or grants made on account of ordinary plague charges, and no funds held on the one account should under any circumstances be used for expenditure on the other. No officer to whom a grant has been made for plague expenditure generally is on any account permitted to disburse from it sums properly debitable to Discretionary Relief, and no outlay on Discretionary Relief is to be incurred from Government funds under any circumstances without a prior grant having been sanctioned by the Plague Commissioner. The names of the officers entrusted with advances for Discretionary Relief and the amount of each advance must be approved by the Plague Commissioner. The sums advanced will be taken into consideration in determining the proportion of plague expenditure to be borne by Government and the amount of aid to be given to Local Bodies when the accounts are finally adjusted.

7. For the due control of this expenditure the Circular and Forms appended to this Resolution, which have been prepared by the Municipal Commissioner, Bombay, and which have been modified to suit requirements elsewhere, are approved. The Forms have been made as simple as possible with a view to minimise the labour involved to the officers concerned while maintaining a record of all that it is necessary to know. The account of the Deputy Commissioner for Plague Operations in Bombay with the Plague Commissioner, and the District Officers' accounts with the Deputy Commissioner, will be kept up in the Chief Accountant's Office in ordinary account form. Elsewhere those accounts will be kept by the Huzur Deputy Collector. A receipt must be given by every officer for each sum advanced to him. The Plague Commissioner will inform the Accountant-General of every



advance made by him and the names of those authorized to receive advances and the amount of the advance allotted in each case. The Plague Commissioner will forward weekly to the Accountant-General one copy of Form C with his countersignature, which will be the voucher for the expenditure.

8. It is not intended that the necessarily very limited allotment available for Discretionary Relief should replace or dry up private charity. On the contrary it is hoped that these instructions will stimulate many to come forward to supplement the sums placed at the disposal of Officers. It will prove convenient that any officer applying for an advance for Discretionary Relief should state the amount and the principal objects for which he requires it and how long he thinks it will last. Experience has shown that even small sums judiciously expended are greatly appreciated. The Deputy Commissioner in Bombay and elsewhere the Collector of the District will promptly caution any officer whose expenditure appears to be unduly heavy, and will take early steps to satisfy himself whether the distress or the circumstances are so exceptional as to justify the expenditure, and whether the discretion is being wisely exercised.

9. A copy of this Resolution should be furnished to the Government of India in compliance with the request conveyed in paragraph 2 of their letter No. 4547-A., dated the 15th October 1898, Finance and Commerce Department.

A. WINGATE,

Acting Chief Secretary to Government.

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### Circular.

Small advances will be placed by the Deputy Commissioner, Plague Operations, Bombay  
Collector at the disposal of certain officers for discretionary relief in cases of distress, &c., connected with plague. This money must be regarded as quite distinct from advances or grants made on account of ordinary plague charges and no funds held on the one account should under any circumstances be used for expenditure on the other. There must be no outlay whatever without a prior grant having been sanctioned by the Plague Commissioner.

2. Officers will themselves learn by experience in what direction this relief should be afforded and they should freely report for orders or for information any instance requiring relief not enumerated below, but as a general guide the following are indicated, provided always that the relief is intended for the poor and the poor only :—

(a) *Hospital Relief.*

- (1) The provision of extra rations before discharge.

*Note.*—This would ordinarily be arranged under the special direction of the Deputy Commissioner for Plague Operations, Bombay.  
Collector.

- (2) The gift of clothing or small sums of money on discharge.
- (3) The payment of funeral expenses.
- (4) The support of a family, where necessary, during illness or interruption of ordinary avocations, while in hospital or the hospital camp.
- (5) Assistance to survivors or convalescents to return to their own homes.

(b) *Compensation.*

(1) Payment of prompt compensation for destruction of or damage to clothing, &c.

(2) The grant of a trifling sum to cover in the case of the poorer classes the petty expenses incidental to the vacation of a house.

*Note.*—Compensation for articles destroyed or damaged must be paid on the spot, and may be calculated not only with regard to the value of the article but also with regard to the cost of replacing it.

(c) *Camps.*

(1) Compensation for interruption of work or loss of wages.

(2) Expenses of transit.

(3) Provision of warm clothing or a blanket as a protection against the increased cold of camp life.

(4) Provision of cots as a protection against dampness. Expenditure under this head (4) must, however, be previously sanctioned by the Deputy Commissioner for Plague Operations as "Discretionary Relief" is intended as far as possible actually to reach the pockets of the poor.

3. For each advance received the officer will furnish a receipt. No vouchers will be required from the officers to whom advances from this Discretionary Relief Fund are made, except in case of purchase of supplies, blankets, &c., from tradesmen, when the receipts must be attached to the weekly return. They will, however, be personally responsible that the money is properly expended and that the accounts are correctly and punctually submitted.

4. It may be impossible for the officer entrusted with an advance to be promptly on the spot in every case where relief is desirable, and these officers are therefore authorized to entrust small sums to those of their volunteers and those of their assistants in whose integrity and discretion they feel that they are able to repose complete confidence. But such advances must not appear in the accounts and the officer making the advance must exact from such persons a careful record of the information necessary to complete the accounts in the prescribed form, and any balance remaining with such persons should appear in the accounts in the balance remaining in his own hands, and he must be ready to hold himself personally responsible for it. Each person so entrusted by the officer must keep the same cash book and details as the officer, and the officer must keep a record of any sums so entrusted.

5. Accounts should be kept in the accompanying sample Form A.\*

6. If the advance runs short during any week it may be recouped on application and on furnishing a receipt to the Deputy Commissioner Collector. But the detailed account will be furnished only once a week to the Deputy Commissioner Collector as provided in the next rule.

7. A weekly return in the accompanying Form B\* should be forwarded to the Chief Accountant Huzar Deputy Collector and should be for the week ending 6 A.M. on Saturday.

It should reach the <sup>Chief Accountant</sup><sub>Huzar Deputy Collector</sub> on Saturday if possible, and as soon as possible thereafter the amount spent during the week will be recouped to the officer concerned. If necessity arises additional advances can be made during the week in anticipation of the submission of accounts. Expenditure will be classified under 3 heads as shewn in the Forms—Hospitals, Compensation, Camps.

To avoid confusion it is directed that where a camp is combined with a hospital, the expenditure should come under the head 'Hospitals.' Camps will include authorized segregation houses.

8. The <sup>Deputy Commissioner</sup><sub>Collector</sub> will arrange that the cash book of each officer holding an advance shall be inspected <sup>once a week</sup><sub>from time to time</sub> so that he may be in a position to satisfy the Plague Commissioner that the relief money is being expended on the object for which it has been given, that there is no waste and that due foresight is exercised so that the small available funds may not too rapidly be exhausted.

9. Form C\* will be prepared from Form B and will be forwarded punctually by the <sup>Deputy Commissioner</sup><sub>Collector</sub> to the Plague Commissioner in duplicate.



**A.***Cash Book of**Ward for Discretionary Relief Fund.*

RECEIPTS.			EXPENDITURE.						
Date.	From whom received.		Date.	Name and Address of Recipient.	Purpose of Relief.	Relief in Hospitals.	Compensation.	Relief in Camps.	Weekly Total.
	Opening Balance	Rs. a. p.				Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
October 24th.	Deputy Commissioner.	50 0 0	October 24th	A. B. Thomas Street	Bedding burnt.	.....	4 0 0	.....	
			" 24th	C. D. Byculia Camp	Expenses of moving to Camp.	.....	.....	1 0 0	
			" 24th	E. F. Maratha Hos-pital.	Funeral, expenses of.	5 0 0	.....	.....	
October 29th.	Deputy Commissioner.	25 0 0	" 27th	G. H. Maratha Hos-pital.	On discharge.	2 0 0	.....	.....	
			" 27th	K. L. Byculia Camp	Wages for days in Camp.	.....	.....	1 8 0	
				&c.					
	Total for Week ending Oct. 30th	75 0 0		Total for Week ending October 31st.		7 0 0	4 0 0	2 8 0	13 8 0
							Balance on hand	61 8 0	
October 31st.	Opening Balance &c.	61 8 0							75 0 0

**B.***Return of Expenses on Discretionary Relief for Week ending 30th October 1898.*

Date.	Receipts.				Expenditure.			
				Rs. a. p.				Rs.
October 24th	...	From Dy. Commissioner	...	50 0 0	Hospitals	...	...	7 0 0
October 29th	...	Do.	do.	25 0 0	Compensation	...	...	4 0 0
					Camps	...	...	2 8 0
		Total	...	75 0 0				
					Total	...	...	13 8 0
					Balance in hand	...	...	61 8 0
								75 0 0

Vouchers for all articles purchased from tradesmen are attached hereto. I certify that all the charges entered in this return have been incurred by me on the objects therein mentioned.

District Officer.

Forwarded to the \_\_\_\_\_

C.

*Return of Expenses on Discretionary Relief for Week ending*

Date.	RECEIPTS.	EXPENDITURE.					
		Disbursing Officer.	Relief in Hospital.		Compensation.		Total.
			Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
October 24th ...	Balance ... ..	District Officer, A Ward, Fort and Colaba ...	120 0 0	50 0 0	35 0 0	205 0 0	
	Received from Plague Commis- sioner ... ..	B " Mandvi, &c. ...	200 0 0	100 0 0	15 0 0	315 0 0	
		C " " ...	25 0 0	40 0 0	10 0 0	75 0 0	
		D " " ...	.....	175 0 0	5 0 0	180 0 0	
		E " " ...	.....	.....	.....	.....	
		F & G Wards " ...	.....	.....	.....	.....	
		* Balance in hand ...	345 0 0	365 0 0	65 0 0	775 0 0	
	Total ...		.....	.....	.....	4,225 0 0	
						5,000 0 0	

\* Includes balances with Disbursing Officer.

I certify that I have received accounts for the sums entered in this statement and have satisfied myself that the money is properly expended.

Date \_\_\_\_\_ 189 .

Signature of the Deputy Commissioner  
in Bombay and of the Collector of  
the District elsewhere.

Forwarded to the Plague Commissioner.

Below is a statement showing the amounts expended by the various Officers to whom advances were entrusted. It will be seen that Rs. 800 was contributed towards the maintenance of the private Hospitals of two impecunious communities, the remainder was spent in ordinary relief in the Districts and Hospitals.

Statement of Expend incurred on Discretionary Relief from 12th November 1898 to 27th May 1899.

Particulars.	Amount.	Names of Officers.	Relief in Hospital.		Compensation.		Relief in Camp.		Total.		Advance made to Disbursing Officers.
			Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	
Amount of advance sanctioned—											
By Government for Discretionary Relief—											
On 2nd November 1898	...	...	...	...	...	...	...	...	...	...	...
" 19th January 1899	...	...	...	...	...	...	...	...	...	...	...
" 3rd February	...	...	...	...	...	...	...	...	...	...	...
" 23rd	...	...	...	...	...	...	...	...	...	...	...
" 17th March	...	...	...	...	...	...	...	...	...	...	...
" 11th April	...	...	...	...	...	...	...	...	...	...	...
" 4th May	...	...	...	...	...	...	...	...	...	...	...
Total...	Rs. 60,000 0 0		Rs. 12,553 3 3		Rs. 21,788 4 0		Rs. 16,157 8 1		Rs. 50,498 15 4		
									Balance in hand ...	9,501 0 8	
									Total Rs...	60,000 0 0	

• The Secy., Ben-Israel Hospital ..	Rs. 100 0 0
Do. ..	500 0 0
Mr. Desabloy Framil Dubush for rations, &c., supplied at Arthur Road Hospital ..	556 2 9
Ben-Israel Hospital ..	200 0 0
Compensation to Sarco Laxman ..	59 0 0
Do. through Mr. M. C. Marzban ..	50 0 0
Mr. Limji Maneesji Contractor, for cots supplied to Byculla Camp ..	Rs. 1,456 2 9
Do. ..	105 0 0
Do. ..	125 0 0
	Rs. 1,686 2 9



The relief of distress in the principal public hospitals was primarily undertaken by Professor O. V. Muller; he was subsequently assisted by Mr. V. N. Mandlik and on their departure, Mr. G. Lund undertook the work at the Maratha and Arthur Road Hospitals, the Rev. R. M. Gray and subsequently the District Officer, A Ward, that at the Modikhana Hospital, and the District Officers concerned that at the other hospitals. The nature of the work done is described in Professor O. V. Muller's interesting report which is given in full below :—

*Report on my work as Official Plague Hospital Visitor in Bombay City  
from November 1st, 1898, to April 1st, 1899.*

Professor  
Muller's Report.

In October 1898 I was asked by Mr. (now Sir Andrew) Wingate, Chief Secretary to Government and Plague Commissioner, if I were willing to undertake the distribution of a Relief Fund offered by the Government of India for the popularising of the plague hospitals in Bombay. I, thereupon, offered my services as far as my college work would allow.

Work easy in  
November; cases  
few.

I at once began visiting the plague hospitals and enquiring into the circumstances and wants of each patient. I thus visited every morning the Arthur Road, Modikhana and Mahomedan General Hospitals and later on the Julai Hospital of Ripon Road. The patients were few in November—7 or 8 only in the Arthur Road Hospital—and the type was mild, so most cases lingered long or recovered, and thus gave me time to help. I made the personal acquaintance of, learnt the family history, &c., &c., of all the 30 or 40 plague cases in these hospitals and aided them by means of the Relief Fund in various ways.

Methods of relief.  
Fetching friends.  
Sending convales-  
cents to their  
homes in the  
country, &c.

Thus, if any patient had no friends visiting him, I fetched to the hospital any relative living in Bombay, or, if from up-country, I wrote to his friends, with the result that these latter often came to Bombay to nurse their sick relations. The Fund paid for their passage down, provided them with means of support and often sent them back again when the patient either recovered or died. The patient when convalescent was also sent to his home in the country if he desired to go. Most Bombay labourers come from the inland villages, and it is very noticeable how large a percentage of cases in the hospitals are new comers, chiefly from Ahmednagar, Satara and Ratnagiri Collectorates, who have been in this city from six months to a few days only.

To quote a few examples—

Examples.

Hassan Mohidin, aged 15, was admitted to Arthur Road on 25th September 1898 and recovered. He was very thin and miserable, and so when the doctor allowed he was supplied, at the cost of the Fund, with extra rations. He was a domestic servant, on Rs. 3 per mensem, to a small grain dealer in Dongri. His father was dead, but I discovered that his mother, a firewood seller, lived at Kalyan. I wrote to her, and finally, when her son was discharged strong and well on 10th December 1898, he was sent home with Rs. 2-8-0 in his pocket, I seeing him off in person.

Sonn Rama, a malee, aged 30, was admitted to the Arthur Road on 26th November 1898. He had no friends in Bombay, at his request I wrote to his brothers in Ratnagiri and told them of Sonn's sickness. One brother immediately borrowed means and came to Bombay and nursed his sick brother. When his means were exhausted, he was helped from the Fund, and when Sonn died, 15th December 1898, the brother was sent home with a few rupees to start with again.

Government  
Resolution, 14th  
November.

On November 14th, a Government Resolution laid down certain rules and directions for the distribution of the Relief Fund which were as under :—

- (1) The provision of extra rations before discharge.
- (2) The gift of clothing or small sums of money on discharge.
- (3) The payment of funeral expenses.
- (4) The support of a family, where necessary, during illness or interruptions of ordinary avocations while in hospital or hospital camp.
- (5) Assistance to survivors or convalescents to return to their own homes.

The methods thus suggested were followed by me in addition to many other little ways of giving help. In short, by means of the Fund I played the part of the plague patient's friend. The mere fact that an officer was being deputed to visit the sick, pleased the sufferers and their relatives, and since the officer was provided by Government with ample funds to relieve distress, he was doubly welcome.

Thus, Abdool Rayman, 18, was the son of respectable parents in Cawnpore. His step-mother was cruel to him and so he ran away from home and made his way to Bombay where he hoped to make a name and fortune. He caught the plague and was taken to the Mahomedan General Hospital. When discharged he was weak, penniless and friendless. So the Fund provided him with Rs. 4 to live on till he could obtain means from his father to return home.

Appointed Official  
Plague Hospital  
Visitor.

On December 3rd, my position was made more regular by the Municipal Commissioner appointing me to be Official Plague Hospital Visitor. I was requested to consult Lient.-Colonel Wilkins, I. M. S., the Special Medical Officer for Plague Operations, and to look after the wants of the patients in—

- (1) The Arthur Road ; (2) the Julai Hospital in the Ripon Road ; (3) the General Mahomedan Hospital, Northbrook Garden ; (4) the Modikhana Hospital.

Any other hospital—and there were a great many private ones—might be added to this list by me if their Managing Committees desired it. I very soon, by request, took over the relief work at (5) the Maratha Hospital, and I have visited occasionally (6) the Beni-Israel, (7) the Jain Hospital and (8) the Khatri Memon Hospital. Nos. 1 to 5 have, however, been my special charge in which I have, as ordered, organized a regular system of relief worked on the lines described below. This system has gradually been elaborated as necessity demanded and as the number of patients in hospitals increased.

The five hospitals mentioned above lie scattered over the town, so I visited them in turn on a bicycle, devoting from 6 A.M. to 10 A.M. daily to this work. While the patients were few I visited each hospital daily, saw each patient and gathered all sorts of information about the sick and their friends and relieved their distress from the coffers of the Relief Fund.

Powers.

*Powers.*—Owing to my visiting the hospitals before the doctors went their rounds, all the hospitals were ordered to give me 24 hours' notice on a post-card of the discharge of any patient ; and this was later extended to all attendants on the sick, who were kept in contact camps next to the hospitals. This latter step was rendered necessary to enable help to be given from the Fund to widows and others who had lost friends or relations in the hospitals and had then been detained for 10 days in quarantine.



No money given  
in Hospital

*No money was ever given to patients while still in hospital or to hospital contacts (attending friends of the sick) till discharged from the camps. The attendant friends were supported, if poor, with free rations. This rule was absolutely necessary to prevent corruption amongst the ward-boys, &c., who might otherwise obtain a share of the patient's relief money.*

Extra rations.

*Extra Rations.*—In consultation with the Chief Medical Officer of each hospital, steps were taken to give extra cooked rations to all weak convalescents, and even to patients, when allowed. Mutton and chicken broths, mutton, chicken, curry, soups, &c., &c., were thus supplied to those whose caste permitted meat diet, and many convalescents from plague, at first too weak and miserable to walk, much less to work, have been sent out well and strong. Mahabee Hanuman was a Purdesi hawker of kerosine, who was admitted to the Arthur Road with plague on 7th December 1898, and Shripati Gunput was a goldsmith from Karad, who was admitted to the same hospital on 26th December 1898. These two men recovered from plague, but lingered on far too weak to be discharged. The Fund thereupon supplied them with extra and special rations, and they regained their strength slowly but surely. The former was discharged on 18th February 1899, the latter not till 5th March 1899, but both were now healthy and strong and fit for work.

Special kitchen  
in Maratha Hospi-  
tal for meat, &c.

In the Maratha Hospital—an excellent and popular institution—a kitchen was established for the Fund in a separate and isolated building and special cooks engaged. Here all extra rations made from mutton or chicken are cooked. I enquire personally on my daily round what convalescents would like meat rations, and if the doctor agrees, rations are permitted, and I enquire of the patient daily whether he has received his extra food. The kitchen cooks and rations are all paid for from the Fund. At the Arthur Road, the ordinary hospital kitchens supply whatever is required in this way. Like our poor in England, Maratha and other Hindus of caste eat mutton if they can afford it, a very rare circumstance. Rations of meat are, therefore, looked upon as a great boon and the Government is blessed for its benevolence.

Biscuits.

*Biscuits.*—A great many sick persons and many convalescent women and children are unable to take much of any bread, so, by means of the Fund, the hospitals have been kept supplied with large tins of "milk" and other plain biscuits made by Hindu bakers. Strict supervision is maintained to ensure that the patients get the biscuit.

Oranges.

*Oranges.*—A contract was made with a fruit merchant at Kampti, who sent twice a week 200 oranges delivered here at the rate of Rs. 3 per hundred. This was increased later on to 200 oranges daily; and finally, since March 15th, to 300 daily. The distribution of this fruit amongst the convalescents and amongst such patients as are allowed them, besides being exceedingly good for them, gives more pleasure and is more popular than any other measure undertaken for the relief of the patients.

Method of deli-  
vering goods at  
various hospitals.

*Method of delivering goods at the various Hospitals.*—In the Elphinstone College a spare room has been reserved for a sort of Depot where are kept, under lock and key, a large supply of tins of biscuits, blankets, cheap toys, &c., &c., and here are laid out the oranges as they arrive. Every day a bullock carriage (rekla) hired at the rate of Rs. 1-4 per day, leaves the College at 2 p.m. and deposits at the various hospitals whatever is ordered. The goods for each hospital are entered in a driver's book and are labelled. The oranges are counted out into special bags—for the number required in each hospital is roughly known—and they and the other goods are received by the man in charge of the hospital office, are signed for in the book, and are kept in the office unopened till I arrive next morning. Oranges are distributed every other day. They are then more appreciated and not looked upon as a right or ordinary ration.



## Toys, &amp;c.

*Lesser Items.*—*Cheap Toys* have been given to gladden the hearts of poor convalescent children. Cheap palm-leaf fans and squares of coarse muslin have also been given to the poor to keep the flies off the faces of their sick friends and relatives.

I have thus generally acted as the friend of plague patients in these hospitals, seeing and, if possible, talking to each person or his or her friends. Where no friends or relatives visited the sick, if any were in Bombay they were fetched, if up-country they were informed by letter of their friend or relative's sickness.

Thus a man, called Govind Chagnanath, was taken to the Modikhana Hospital with plague. There he bemoaned the possible fate of his two little children, aged 6 and 4, who had been left without protectors as his wife was dead. A maternal uncle lived near, but whether he had taken the children or not was uncertain. The address given in Colaba was hunted up and I interviewed the uncle and learnt that the children had been taken to a friend's house in Kamatipura. They were followed up there, taken down to see their father who was overjoyed at the sight of them: they were then taken by the friends, at the expense of the Fund, to their father's village in Ratnagiri where he will, I hope, soon follow them, as he is now convalescent.

A patient has usually some friend who can be found in Bombay. The Hindus are wonderful in their devotion to the sick. Often have I seen merely a fellow-villager giving up his work and earnings to attend on a sick man, or it may be only a fellow-mill-hand from the same mill. The claims of a plague-stricken friend are sacred, no matter what it may cost, nor how great a personal risk is run. A good example was that of Rama Babaji, who walked into the Arthur Road Hospital alone on 17th January 1899, suffering from plague. He was delirious for a very long time, called for his brother and others and declared that as he had come in himself, he ought to be treated kindly. Learning from him that he had lodged in Kathayadadur, Durgadevi, Kamatipura, a visit there showed that he had come from Karad in Satara 15 days before being taken ill. His brother was not known, but several fellow-villagers living in the house came to see him and to cheer him up. He was discharged cured on 5th March 1899, and given Rs. 5 from the Fund to support him till he should be able to find work.

From January 1st to March 31st I have thus visited in—

Number of  
patients, January  
1st to March 31st.

(1) Maratha Hospital ...	2,584	} Total 5,583 patients.
(2) Arthur Road ...	1,316	
(3) Julai ...	306	
(4) Mahomedan General ...	209	
(5) Modikhana ...	1,168	

This does not include friends and attendants and other contacts.

The daily average during end of February and beginning of March has often been in—

Daily number of  
patients 800.

Maratha Hospital about ...	300	} Patients of all sorts.
Arthur Road „ ...	200	
Julai „ ...	100	
Mahomedan General „ ...	60	
Modikhana „ ...	140	

Total about ... 800 patients of all sorts.

## Pecuniary aid.

## Funerals.

*Funerals.*—In deserving cases aid has been given in the shape of money to very poor people to dispose of their dead. The Mahomedans have a caste organization that buries all their poor. The poor Christians are buried by the Municipality—through the Vicar-General, if Roman Catholics. Poor Hindus alone have no organization to help them. The private hospitals have their special caste arrangements.

Arrangements for the proper disposal according to caste of all unclaimed bodies and of those of the very poor were not lost sight of. Through the kindness of the Honourable Dr. Bhalechandra his central organization, first started for the Maratha Hospital, has been extended to the Arthur Road and Modikhana. His staff undertake the disposal of the bodies of all unclaimed or poor Brahmins and goldsmiths (Sonars), the staff being called by telephone direct from the hospitals. A staff of Maratha bearers was organized, paid by the Relief Fund, and these dispose of the bodies of all poor and of all unclaimed Hindus of caste exclusive of Brahmins.

#### Relief.

All friends attending on the patients are, if poor, granted daily rations from the hospitals as they are unable to work while nursing the sick. These rations are now charged to the Relief Fund and they add much to the popularity of the hospitals. Thus if a wife comes to nurse her sick husband she does not starve or fall ill from want of food, to buy which she may have no money, now that her bread-winner is unable to work. These attendants are kept in a camp for ten days after the death or convalescence of their sick friend.

Free rations to attendants on sick.

Thus a Mahomedan, Papamia Shetkarim, lost his brother in the General Mahomedan Hospital. He was unable to earn anything while attending on his brother, he was given daily rations, and on leaving Rs. 3 for food till he should find work.

Another example was furnished by the case of Mathalahubai, a Mahomedan woman, dependent on her husband for support. The latter was taken to the General Mahomedan Hospital with plague and the woman was soon reduced to great straits. The sick man was attended by his brother and has since recovered. Meanwhile, the woman, who remained at home, was given Rs. 5 for her support till her husband's discharge, when further help was given to him, as they were miserably poor.

As no attending friend or convalescent can be discharged, as above stated, without my being given 24 hours' notice, it has been possible to enquire into the affairs of all as they departed and to relieve their distress if necessary.

Money relief how given.

Thus if a poor patient is discharged and is too weak to work and wishes to remain in Bombay he is given sufficient rupees to support him for as long as the doctor thinks necessary. If, as is usually the case, the patient wishes to go to his native village and the same is within the Bombay Presidency, he is furnished with money for a ticket by rail or steamer, as the case may be, and with sufficient money for food *en route*, and if very poor or weak with money to keep him for a week or two on arrival home. Often a long journey has to be taken in a bullock cart in addition to the journey by steamer or railway, if so, funds are provided to defray the cost. The great majority of the poor plague patients in our hospitals have but one desire, *viz.*, to get home to their villages in the country as soon as they are able to leave the hospitals. Means to enable them to proceed home are, therefore, a very acceptable and popular form of relief. The payments are properly assessed according to the cost of the journey, length of time it takes, &c., &c. To ensure that the money is really being spent on tickets, &c., a trustworthy messenger (peon) from the hospital accompanies the person to the railway station or pier and brings back the numbers, &c., of the tickets. Any number of examples of this form of relief might be given: a few typical cases are quoted below:—

Patients sent home to their villages on recovery.

#### Examples.

Nana Saula, Mhár, aged 10, was a bright youth who appeared with his mother and grandmother Bhagu Madu. He had lost his father in the Arthur Road Hospital of plague. They were quite helpless, but had friends near Indapur and desired to go there owing to the approaching confinement of the mother. They were given from the fund Rs. 5 for railway tickets and Rs. 5 for cart-hire, food, &c. Total Rs. 10.



11317 Jessoo was the widow of Gopal, caught the plague and was admitted to the Maratha Hospital; when she recovered she was, on 9th February 1899, sent home to her friend at Malvan. For fare by steamer Rs. 2, for food Rs. 2-8 and a blanket were bestowed upon her.

Ahila, widow of Govind, lost a little girl, her only child, in the Maratha Hospital. Her old blind mother was dependent on her. Both were disconsolate and helpless, so they were sent home to Talegaon, where they had friends, and were given Rs. 5 for the journey and for food, &c., on the way.

Luximan, son of Babaji, a barber, suffered from plague in the Maratha Hospital; when he recovered he was too weak to work, so he and his old father, who had been nursing him, were sent home to Kelemergaum in Ratnagiri and given Rs. 5 for the journey and a blanket each, as they were very poor.

To quote one more case. Bhagi Dadu, a Maratha, aged 45, was admitted with his wife and eldest daughter to the Maratha Hospital, all three were down with plague. At the same time three other little children of his were taken to the contact camp, next the hospital, and maintained there. Bhagi and his daughter recovered but his wife died, and he and his four little children were given Rs. 10 to take them home to Karad, as they were without means and the father too weak to work.

Again where a patient has lost his or her employment, especially if they be domestic servants, endeavours are made to get them, when discharged, either back into their old places or into new situations. Where they have suffered loss and so been incapacitated for work, their loss has been made good.

Thus, the daughter of Luis Santan Fernandez, a poor tailor, was taken to the Arthur Road with plague. He and his wife were turned out of their home and they and all their goods taken to the camp next the hospital. In moving, a Singer's sewing machine on which the family depended for their livelihood was damaged, so as to become useless. The machine was overhauled and restored at the expense of the Fund at a cost of Rs. 11-9-0, and when in time the daughter was discharged cured, the family departed blessing the Government for their timely aid.

In all cases where the discharged patient is poor and needy, presents of clothes and a blanket are given, a stock of these being kept under lock and key at each hospital—replenished at times by the “recla” service as described above from the Central Depôt at the College. As regards the friends or relatives attending on the sick, if they have to be fetched from a distance, the cost of their coming and of their final return is defrayed, or, if possible, their losses made good. Thus, one Daku Krishna came from Fonda, Ratnagiri, 24 miles by road to Devgur bunder and thence by steamer to Bombay, to nurse his son (24) down with plague in the Maratha Hospital. His son died, and as all his funds were spent, he was sent home to his village at a cost of Rs. 5.

In another case a Mahomedan, Balamia, fell ill of plague, was taken to the Mahomedan General Hospital and ultimately died. His wife Kandabai and his sister Maiboo, with his two little children, came from Angepur, Satara District, to nurse him. The man was a daily labourer, the women had spent their last anna in coming to nurse him, so, when he died, they were given blankets and sent home with half-a-month's provisions at a cost to the fund in cash of Rs. 11.

Again, a Madrassi butler, by name Ashebai Rameshawami, threw up a good place at Igatpuri and came with his family, a wife and two children, to the Camp, Arthur Road, to attend on his son down with plague in the hospital. His son died



and the father was left without any means, so he was given Rs. 5 to support his family while he sought re-employment. He was also given a certificate setting forth his hard case. In due course he got a new place and came to the hospital to report the same and to thank Government for their help.

Widow through  
plague.

When a poor woman loses her husband in a plague hospital, a very, very frequent occurrence, as almost every Hindu has a wife, and the woman is left helpless perhaps with a large family, she and her children are kept for 10 days in a camp. After that, if they have not developed plague, their circumstances are enquired into, and, if poor, they are helped. The woman and her children are usually sent home to her native village if she has any friends or relatives there, the journey money for all is provided and sufficient for their support for a fortnight, three weeks or a month after their arrival home according to their circumstances. If they desire to stay in Bombay, friends or relations are hunted up and means for a month's support provided. Thus, Mazana Bayi lost both her husband Hone and her daughter Govi (8) of plague in the Arthur Road. She had two little boys and a mother-in-law to support. She was given Rs. 7 for food and secured free quarters for the present in a plague refuge camp. Again, one Darkabi, widow of Nanbhai, lost her brother, Gunput Govind, of plague in the Maratha Hospital. He was her only support. She was given Rs. 5 for her immediate support and intended to seek domestic service.

In another case a woman, called Hannahbai, lost her husband, Moses Suliman, of plague in the Beni-Israel Hospital. She had two children, aged 3 years and 3 months, respectively, and was very poor, weak and helpless. She was given Rs. 10 to support herself and her family till strong enough to work as a servant. But nearly all the women left widows through the ravages of plague desire to go to their country where they are known and have friends. Of this innumerable examples might be quoted, a few are given below.

Muktabai, widow of Narayan Babaji, who died of plague in the Maratha Hospital, had four little children (two girls 8 and 6, one boy 3 and one baby-girl 1). Her husband was a victoria driver. For his carriage he paid the cab-master Rs. 4-8-0 a day, and all earnings beyond were his own. He was ill for over a month and so his widow was left without any means. They were all supported with rations in the hospital camp while the man was ill, and when he died they were all sent home to Khedgaum in Satara District, being given two blankets, Rs. 5 for tickets and Rs. 5 for food.

Sheboo was left a widow through the death of her husband from plague in the Mahomedan General Hospital. She was alone in Bombay without means and without friends. At Karad lived her mother, who owned a little land and who was supporting Sheboo's daughter. So she was sent home at a cost of Rs. 5.

Another widow Satwaji and her little son were sent home to Serani in the Poona District, her husband having died of plague in the Maratha Hospital and left her penniless. At Serani she had friends. Cost to the Fund Rs. 5. A woman, Hurni, who had lost her husband through plague in Arthur Road Hospital was, with her two little boys, sent home to Ahmednagar to her mother-in-law at a cost of Rs. 5.

While in the case of Luximan who died of plague in the Maratha Hospital, leaving a widow and four small children of ages ranging from 3 to 10 absolutely helpless, they were all shipped to Ratnagiri to Chiplun, their native town and given tickets and some means for support, in all Rs. 12. This was a very distressing case, for even at Chiplun they had no relations and would have to rely on friends.

Perhaps a still more unfortunate case was that of Gimne Vithu, an old blind widow, who lost her son in the Maratha Hospital. He was her sole support. She was left with a grandson, aged 10, and implored me to beg Government to send her away from Bombay, a city of misery and death to which she and her son had come a short month ago, hoping to earn high wages. She was sent with her grandson her home near Poona, being given altogether Rs. 10.

#### Orphans.

In the case of orphans relations are hunted up, if in Bombay, or written to, if any exist, elsewhere. Meanwhile the children are supported by the Fund in the hospital camps and when the relatives arrive, if poor, their expenses are defrayed and the children are fitted out with clothes and money for their immediate support. To quote some examples, Luximan and his wife were brought to the Arthur Road Hospital, where they died of plague, on successive days, 15th January 1899. Four little children—Vithal 8, Ragu 5, Gungi 6 and Tani 2—were left in the camp attached to the hospital and were maintained by daily rations.

Tani, the youngest girl, developed plague and died at once on 17th January 1899. Enquiries led to the discovery of a maternal aunt in the service of the Health Department at Colaba, and a grandmother at Sangameshvar in Ratnagiri Gungi, the eldest girl, developed plague on 18th January 1899 and died on 21st January 1899. The aunt conducted her funeral, her husband also appearing. They, however, were poor and had children of their own. Further enquiries led me to discover a maternal uncle, Piraji, coachman to Mr. R.—of Byculla. His wife was in his country, he had no children, his brother and mother lived with him. His pay was Rs. 16 and he looked a good man. He, therefore, was given the two survivors after their ten days' quarantine. For clothes, &c., Rs. 5 were granted for each child as their family had lost everything they possessed.

Another case was that of a little girl Krishna (12) who was admitted to the Arthur Road Hospital, on 28th November 1898, and was unconscious for 12 days but finally recovered. Her father had died of plague in the town, her mother died of the same complaint in the hospital, and her little brother, aged 3, was admitted to the relapsing fever ward. After two months I discovered a maternal uncle who took away the boy now well at once, while little Krishna was handed over to him on 9th February 1899 with Rs. 5 for her outfit and support.

The families of a plague patient are usually taken to the hospital contact camps, and if poor are there supported while their bread-winner is sick in the hospital. If the wife or children have not been brought owing to absence from home when the case occurred or the like, they are fetched to the hospital camps and maintained by being given daily rations.

Such is the nature of the various reliefs given when once the deserving cases have been picked out. When the number of cases in the hospitals began to increase at first slowly then rapidly till they numbered close on 800 it became necessary to frame some regular scheme by which the deserving cases could be brought to my notice without the necessity of enquiring personally into the circumstances of every patient rich or poor.

#### Methods for ascertaining circumstances of patients.

The aid of the hospital authorities was therefore enlisted. The Doctors, English Nurses, Assistant Surgeons and Hospital Assistants and Compounders, all helped to call my attention to deserving cases. In time, however, the mere writing down of the particulars of deserving cases, brought to my notice by these various agencies or through my own enquiries, took far too long when several hospitals had to be visited during the morning. Finally the information required



was classed under various heads and books of printed forms supplied to the four hospitals, Arthur Road, Maratha, Modikhana and Mahomedan General. The forms were in duplicate. The form used was as follows :—

The "Remarks" and the foot-note written in by Relieving Officer, rest by hospital staff.	Duplicate.	
	Hospital— <i>Maratha</i> No. _____	Hospital— <i>Maratha</i> No. _____
	Name— <i>Anandi, widow of Gopal.</i>	Name— <i>Anandi, widow of Gopal.</i>
	Caste— <i>Maratha.</i> Sex— <i>Female.</i> Age 25.	Caste— <i>Maratha.</i> Sex— <i>Female.</i> Age 25.
	Occupation— <i>Her husband a coachman.</i>	Occupation— <i>Her husband a coachman.</i>
	Income— <i>He got Rs. 11.</i> When admitted— <i>22nd February 1899.</i>	Income— <i>He got Rs. 11 per month.</i> When admitted— <i>22nd February 1899.</i>
	Bombay address— <i>Girgaum Back Road.</i>	Bombay address— <i>Girgaum Back Road.</i>
	Rent paid— <i>Rs. 2 per month.</i>	Rent paid— <i>Rs. 2 per month.</i>
	How long in Bombay— <i>One year.</i>	How long in Bombay— <i>One year.</i>
	Native place— <i>Dapoli, Ratnagiri.</i>	Native place— <i>Dapoli, Ratnagiri.</i>
	What relations— <i>A daughter.</i>	What relations— <i>A daughter.</i>
	Who attends _____	Who attends _____
	Remarks— <i>Wants to return to her country where she has friends. Her husband died of plague in hospital. No means.</i>	Remarks— <i>Wants to return to her country where she has friends. Her husband died of plague in hospital. No means.</i>
	Date— <i>7th March 1899.</i>	Date— <i>7th March 1899.</i>
	<i>Both sent home. Tickets Rs. 4; Food Rs. 3, and 2 blankets. Total Rs. 7.</i>	<i>Both sent home. Tickets Rs. 4; Food Rs. 3 and 2 blankets. Total Rs. 7.</i>

When a patient was to be discharged or a relation who had been attending on a sick person was to be let out from quarantine, and the hospital staff held the case to be deserving of help from the Fund, all the details were filled in before my arrival, excepting the column for "Remarks." The cases would then be enquired into one by one and action taken accordingly. The reasons for giving relief, the amount and nature of the relief, and any other noteworthy particulars would be written down under the remarks column also in duplicate. The money allotted from the Fund would then be paid. The duplicate forms would be taken away by the Relieving Officer and afterwards copied into the weekly detailed statement of expenditure furnished to the Chief Accountant of the Municipality for audit and control. Very great help was given in this way at the Maratha Hospital by the Hospital House Surgeon, Suntaji Ramji, a retired Government Hospital Assistant, who studied all the cases in his official capacity and brought all deserving cases to my notice, filling in their forms; at the Arthur Road this work was done by the Hospital Assistant Mr. Samson; at the Mahomedan General by the Mahomedan Doctor in charge of the hospital, Timour Rehman, an excellent fellow, and at Modikhana by Dr. Tarkud, the Medical Officer. These returns were checked by my own observations and notes, as I made a point of going through all the wards and seeing all the patients, talking to many of them or to their friends, and gathering information from the nurses and attendants. Moreover, it was open to any patient or his relatives to appeal to me at any time, which they often did, for it soon became known to all in the various hospitals that the Government had sent me provided with ample funds to help all the poor and distressed on their discharge from hospital.

#### Julai Hospital.

At the Mahomedan Julai Hospital in Ripon Road the process was somewhat different. There were here no nurses and no European treatment. A native Hakim controlled everything, all the arrangements were thoroughly native, and the patients themselves belonged to a poor and rather turbulent class. Special efforts were, therefore, made to make this hospital popular. The convalescent patients and contacts were all kept at the hospital till they were quite hale



and hearty. Then on a Friday morning the committee of leading men of this section of the populace, who have established the hospital and who largely control it, would meet me at the hospital. The people to be discharged would come up one by one and their circumstances be enquired into and the relief required, if any, assessed by the whole committee sitting in a sort of darbar the chairman presiding and I acting as secretary and general adviser, writing down all particulars and handing the necessary money to the chairman for distribution to each case as it was decided on. A large pile of blankets, several sacks of oranges and trays of biscuits, &c., were conspicuous. In short, the whole affair was made as gay and bright as possible, and the entire neighbourhood learnt of the patients who had been discharged and of how much the Government had done for them. Thus on March 17th, 38 persons were discharged and relieved in various ways at this hospital.

Below are given a few examples of the cases dealt with on March 17th at the Julai Hospital :—

Jumni (25), widow of Imam Ali, who died of plague last year. She had just recovered from plague. She worked with the weavers, but was too weak to earn anything for some time. Given Rs. 5 and a blanket. Again another widow Khamani had just lost her son in the hospital. She, too, worked with the weavers, but was too weak owing to the strain of nursing her son to earn at present. Given Rs. 3 and a blanket. Another woman Rechi was left a widow with 3 small children and a baby, her husband having died of plague in the hospital. She was very poor, so was given 2 blankets and Rs. 8. Lastly, Lal Mahomed, a very old man, who had lost seven relations in the hospital, was granted a blanket and Rs. 5 for a new start.

Owing to their distance apart and the number of patients, it soon became impossible to visit all the hospitals in a single morning. They were therefore visited as follows. The Julai (Ripon Road), the Mahomedan General (Northbrook Gardens) and the Modikhána were visited on Mondays, Wednesdays and Fridays, while the Maratha and Arthur Road were visited on Tuesdays, Thursdays and Saturdays, no patients being discharged except on these days from the respective hospitals. In February, however, a young Bráhmín gentleman of independent means, a B.A., and a former pupil of mine at Elphinstone College, V. N. Mandlik by name, volunteered to help me with the Arthur Road Hospital. Mr. Mandlik has visited this hospital every Monday, Wednesday and Friday and dealt with all cases maturing on these days.

We used the same book of particulars and so each was able to read on the counterfoils what the other had done in the way of relief. Mr. Mandlik has worked very hard and has made himself beloved by all the patients in the wards, and he has set an example which might well be followed by some of the young educated and wealthy citizens of Bombay, who are too prone to fly from the city on the approach of danger. Mr. V. N. Mandlik's work is the more praiseworthy as he is not protected by the racial peculiarities or habits which seem to shield and to render a European comparatively immune.

During the period, January 1st to March 31st, as above stated, 5,583 patients of all sorts have been received in the five principal hospitals visited. Out of these, 622 separate cases—a case may include a large family or group of friends or relatives—have been relieved pecuniarily in some of the abovementioned ways at a cost of Rs. 3,543. This does not include the money expended on stocks of

blankets, clothes, oranges, biscuits and other extra rations amounting to about Rs. 1,000 more. Omitting fractions the weekly totals have been as follows :—

					Number of Cases relieved.	Cost.
						Rs.
Fortnight ending	January	14th	...	...	17	87
Week ending	"	21st	...	...	20	96
"	"	28th	...	...	25	93
"	February	4th	...	...	21	109
"	"	11th	...	...	44	197
"	"	18th	...	...	25	142
"	"	25th	...	...	39	287
"	March	4th	...	...	77	400
"	"	11th	...	...	61	312
"	"	18th	...	...	85	488
"	"	25th	...	...	60	334
"	April	1st	...	...	43	323
"	"	8th	...	...	105	675
Total					622	3,543

The above report sets forth in detail how I have endeavoured, with the limited time at my disposal owing to my professorial duties, to carry out a scheme which owed its conception to the kindness of heart of His Excellency Lord Sandhurst, and to the generosity of the Government of India, who provided the funds. Though the distribution of the fund and the keeping of the necessary accounts have required a great effort and have left me no leisure at all, the gratitude of the patients both to Government and myself has been an ample reward.

The object of the fund was to endeavour to alleviate the distress and untold misery caused amongst the poor of Bombay by this terrible pestilence. By doing this through the hospitals, Government have shown more clearly than ever to the masses that they are actuated by the desire to help the plague-stricken in every way. Every rupee, every blanket, every orange that has been given away has been given in the name of the Government (Sircar) and it has been fully explained to all again and again that the Government desired to help all who came to the hospitals and who required help. The scheme has undoubtedly done a very great deal to popularize the hospitals. The plague-stricken feel now that if they go to hospital not only are their wants attended to and everything done to save them that human skill can devise and money procure, but their wives and children and other relatives are taken care of while they are sick, and if they die a good Government will provide for their dear ones and send them to their homes. The only pity seems that Government should not have let the general public know more about their great scheme of benevolence. Their kindly action is, however, well-known and greatly appreciated amongst those classes who suffer most from the plague, who form in short the bulk of our hospital and contact camp population.

The increasing popularity of the hospitals has been very marked and apparent to any frequent visitor to these formerly dreaded institutions. On any morning at the Maratha Hospital an observer may see patients arriving voluntarily at the hospital gates. Some come in bullock carts, some in *reclas*, some even in Victorias (but these are disinfected). Others are carried in on the backs of their friends, and I have seen a sick wife led gently along by her husband, or a mill-hand has been brought in carried along by two fellow-workers whom he held round their necks for



support. The most frequent course, however, is for the sick man's friends to come and borrow an ambulance to take him to hospital. A similar increase of popularity is also apparent at the other hospitals.

When we compare this state of affairs with the dread of the neglected hospitals of 1896-97, we see how much the benevolent methods of Government have accomplished in popularizing our plague hospitals.

OSVALD V. MULLER,  
(Volunteer) Official Plague Hospital Visitor,  
Professor at Elphinstone College, Bombay.

10th April 1899.

**Use of the Funds  
in the Districts.**

The discretionary relief fund played an equally conspicuous part in the work of the District Officers in their districts. The following note by Lt. Warneford shows how it was utilised :—

“ This has been found most useful in promoting the efficiency as well as the popularity of plague measures. In C Ward a large amount, varying from Rs. 2,500 in February 1899, to 600 or 700 in May 1899, has been expended. In such a large district it was found impracticable to keep the actual distribution of relief and of compensation in the hands of the District Officer alone, and accordingly out of the total standing advance in the hands of the District Officer, small standing advances were made to each of the Assistant District Officers and to the Section Medical Officers. These standing advances varied from 25 to 35 each according to the number and class of the population of each Section. On the removal of patients to Hospital, or the despatch of their relations to a camp as contacts, or on the burning of the clothing or bedding belonging to a plague case or found in a plague infected room, the Officer present paid immediately a small amount to the persons concerned—that is, to compensate them for the wage-earning time lost to them by their removal from their home, or for the expenses they would probably be put to by such removal, or for the value of their property destroyed or in fact for any loss which would be entailed by their temporary disturbance from their ordinary work and residence.

“ A list of the amounts thus expended—giving full details as regards the cause of the expenditure, date, time, and place, and names of the persons—was submitted by the paying officer to the District Officer every Friday morning. This list was checked by him, and if approved, the amount expended was refunded to the paying officer next day, thus making his standing advance complete again. Then again on occasions when a large number of people, three or four hundred say, were being removed to a camp on account of their houses or their immediate neighbourhood being badly infected the District Officer was usually present personally to distribute relief. It was found expedient in such cases to give an amount of money to each family sufficient to compensate the wage-earning members of it for the loss of a few hours or of a day's work.

“ In all cases the carts or coolies required to transport contacts or evicts and their property to camp were also paid for, and this was done in the following way :— In order, as far as possible, to check fraud or waste on the part of subordinates, the officer or his inspector when despatching a loaded cart off to camp noted down on a slip of paper the address from which it was sent and the exact time at which the cart was first hired. The camp-master having had the cart unloaded added the exact time of unloading on this slip and sent the cartman off to the District Office, where he was paid the correct amount due to him in the presence of the District



Officer. This system reduced considerably the possibility of fraud, and was far more satisfactory to all concerned than the entrusting of money to subordinates to pay these sorts of charges.

“ On the discharge of contacts or evicts from camp the carts to take their kit back again to the same or another residence were also paid for, by a similar arrangement to that described above, and if their residence in a camp or attending on a relation in a hospital was likely to in any way entail loss of wages to them, they were paid a small amount for their support during such period. This, however, was not often done, nor did the people ask for it.

“ It is curious how, once these payments of compensation were started, the people of the poorer classes immediately became aware of the fact, that if removed to a camp or hospital or if their bedding or clothing were destroyed they would get a little money, and naturally this knowledge induced them to regard plague measures with less disfavour. I consider also that this distribution of relief has, *among the poorer classes particularly*, to some extent reduced the concealment of plague and also the removal of plague cases from place to place. No longer fearing great loss or hardship through our measures they no longer take so much care to hide plague cases from us.”

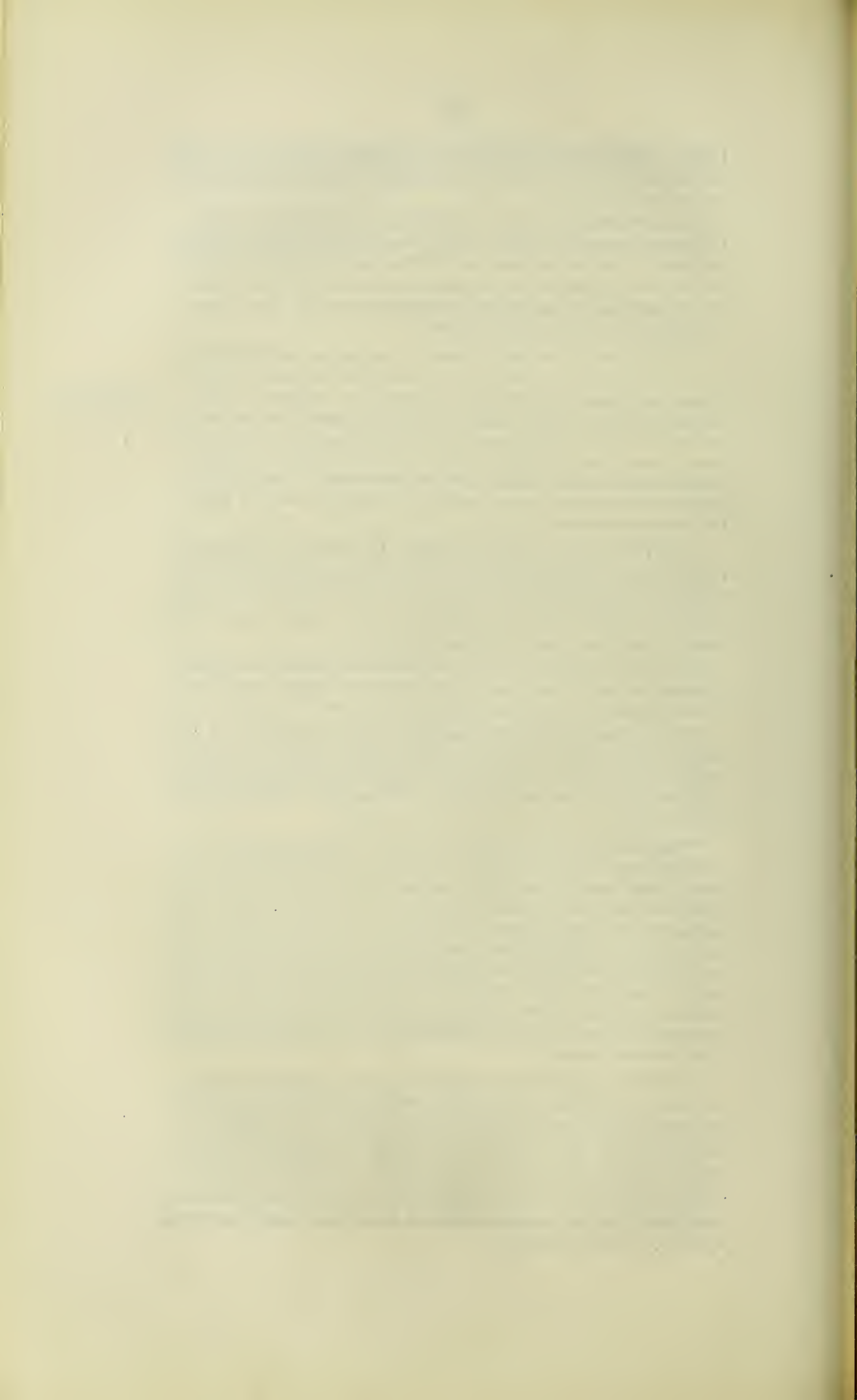
The Fund was not of great use among the well-to-do inhabitants of B Ward South, but elsewhere the District Officers are unanimous in their appreciation of the advantages which have accrued from this generous contribution of Government towards the relief of individual misery in the City. Captain Pritchard writes :—

“ This money was spent in accordance with circular orders issued on the subject. The objects on which it was spent were distinctly limited to plague and those who suffered therefrom either directly or indirectly.

“ As for instance, relief offered to those sent to Camps, also to such as it was necessary to relieve owing to loss of wages, also for property destroyed, and gifts to such as were discharged cured from hospitals and for transit charges incurred in conveyance of evicts and their baggage to and from camps. Also to assist poor families, orphans and such like to their homes out of Bombay.

“ This form of relief gave the best results and the more so according to the tact and care and moderation with which it was used. Considering the poverty and distress always found and in addition the heavy losses incurred by families from plague, this money was an actual blessing to the poor. But great care and moderation were essential in order to reap true gratitude from the people. Else the money was I considered to a certain extent wasted, for though it was better to err on the side of charity than on that of illiberality, yet there was no question of the valuable results that might be obtained by a careful distribution of this Fund. It educated the people, informed them of our open hearted sympathy, linked their sympathies to ours and drew from them something more than a sullen acquiescence in the Government measures.”

The actual assistance in cases of desperate distress has been enormous ; and nothing has done more to convince the people generally that plague measures are intended for their welfare. This change in their attitude has been cheaply purchased at the expenditure of 50,000 Rupees : and to those who have experienced the advantages of the Discretionary Relief Fund it is difficult to realize how previous epidemics have been got through, and impossible to contemplate facing another epidemic, without its assistance.



## CHAPTER VII.

### Volunteers.

The total number of Volunteers on the various Committees in each district is marginally shown.

A Ward	...	...	...	28	More than half of these did real work and rendered valuable service. Their organization and methods varied in different districts.
B Ward (South)	...	...	...	54	
B Ward (North)	...	...	...	21	
C Ward	...	...	...	233	
D Ward	...	...	...	160	
E Ward (West)	...	...	...	47	
E Ward (Byculla)	...	...	...	9	
E Ward (East), Wari Bandar	...	...	...	5	
F and G Wards	...	...	...	102	
Central District	...	...	...	143	
Total	...	...	...	803	

This organisation was, perhaps, more perfect in C Ward than in any other part of the City, though in many other sections the volunteers worked equally well, but rather as individuals than members of Committees.

The following is an account by Lieut. Warneford of the organisation of Volunteer Committees in C Ward, in the month of October, before the formation of the Central District had taken away Kharatalao and a portion of Bhuleshwar :—

“ Each section has a certain number of Committees, as follows :—

Market	...	...	...	...	8 committees.
Dhobitalao	...	...	...	...	7 „
Fanaswadi	...	...	...	...	4 „
Kumbharwada	...	...	...	...	7 „
Kharatalao	...	...	...	...	6 „
Bhuleshwar	...	...	...	...	6 „

“ These Committees are composed of gentlemen who may be divided into three classes as regards their working—(1) those who have influence and who use it actively and personally ; (2) those who have influence but who do little besides lending their names to the Committees ; and (3) those, forming the most numerous class, who have not much influence but who work actively and steadily at their duty of house visitation. On the C Ward Committees there are representatives of all classes and creeds. There are great merchants, leaders of various Hindu and Mahomedan communities, who support caste hospitals and other plague institutions at their own expense. There are many professional gentlemen, doctors, pleaders and solicitors, members of the Bombay Municipality, moulvies and mullahs, shopkeepers, clerks and others. In all there are 37 Committees with 257 members.\* Each Committee is composed of a chairman and from 3 or 4 to, in some cases, 12 or 15 members. These divide the streets apportioned to their Committee between them and inspect these streets individually, under the general supervision of the chairman. At the end of each week the chairman sends in a report to the District Officer of the number of houses visited and reported by his Committee during the week, also of any sanitary defects or other matters that he wishes to bring to notice, and the

\* Note.—At the end of the year when Kharatalao and a portion of Bhuleshwar had been transferred to the Central District there were 32 Committees and 233 members.



“number of cases of plague. The Medical Officer of each section of the ward accompanies one of the Committees at least twice in each week, in order to keep in touch with them, and also to keep up their working. The District Officer also accompanies Committees or particular members at frequent intervals. Their work and its nature varies considerably according to the individuality of the chairman or member and the section in which they work. Some gentlemen go out regularly morning and evening and seem to put a regular enthusiasm into their voluntary duties, others go out once or twice a week, others again (but they are very few) do not go out at all except when stirred up by the District Officer to an occasional effort. Besides their work of house visitation, the Committees or their individual members are of great assistance in many other ways—in reporting dirty or overcrowded houses, in persuading landlords or tenants to linewash and clean their houses, in persuading people to leave infected houses, and go to camps or elsewhere, in fact in a great many ways that cannot be accurately gauged by the number of cases of plague that they do or do not report during the week. I consider that so long as there is an active and intimate connection between the District Officer and his Committees, they are a great and very useful means of carrying out plague measures in a conciliatory manner and also of discovering plague cases. Of course, I am only speaking generally, as in many instances cases of plague are as studiously and effectually concealed from these gentlemen as they are from the District or Medical Officers.”

An endeavour was made in C Ward to get the Committees to assist in encouraging inoculation. But their sympathies in its favour were somewhat doubtful; they never took the matter up very heartily, and practically no result was obtained in this direction, though certain prominent individuals, as has been elsewhere described, made every effort. Later on at the end of May Lieut. Warneford again writes:—

“As regards the Committees in the ward, they have, I think, answered their purpose admirably, while they have not been the means of directly bringing to notice more than a third to a half of the plague cases that we have recorded, yet they have been the means of making the necessity of our measures, and the justice of our intentions, more or less understood by the people so that we have been able to do our work with their good will. In dealing with Committees my object has been to encourage individuality and independence of action on the part of those members who show zeal and capability and accordingly all plague cases and other urgent matters are reported direct to the District Officer or section Medical Officer concerned, while the routine weekly reports of work done are submitted through the chairman. Frequent meetings and discussions have been discouraged, and it has been found that as a general rule the Volunteers have loyally carried out the suggestions made to them. At the same time it has been found very necessary to keep in constant touch and sympathy with them in their work, otherwise they slacken off immediately. Probably better results have been obtained from many small committees, than from a few large ones, as a more independent charge encourages energy and pride in their work. It has been difficult to get the Volunteers to keep a thorough watch on and a record of all sickness found, whether plague or not, as to carry this out completely requires more time and trouble than the average Volunteers can spare. However, in the most plague-infected section of the ward—Kumbharwada—nearly all the members keep a very complete supervision over ordinary sickness, and consequently there is hardly a death that occurs that these gentlemen do not know the previous history of. This, of course, is a great assistance and makes the work of getting hold of every case of plague for disinfection so much the more easy and certain. The part of our work that met at first with rather doubtful support from

“Volunteers was the removal of plague cases to hospital. They were all more or less in sympathy with plague cases being kept at home, and it required much time and trouble to get them to heartily support the opposite principle which has guided us, *i.e.*, that, extraordinary causes (such as great weakness, &c.) apart, it is far better for the ordinary sick man in a native house to be treated in hospital than at home. The broader question of saving the lives of others and of checking plague infection by the prompt removal of plague cases to hospital was not so much dwelt upon as the benefit in each individual case. It has been our consistent policy never to leave a case in the house, unless the patient was in a state unfit for removal, and at the same time we have endeavoured to encourage voluntary removals as much as possible, *i.e.*, removals by the agency of relations or friends or Volunteers alone without the interference or presence of the District Officer or his section Medical Officer, and now I find that in 9 cases out of 10 the Volunteers themselves initiate and encourage immediate removal to hospital.”

Captain Cuppage, who at the end of the year relieved Lieut. Warneford in this District, reports that between November 1898 and May 1899, 1,233 cases of plague out of a total of 2,593 were reported by Volunteers. He adds :—

“When I first joined the District I could not help being struck by the energy which the Volunteers threw into their work. Whenever I went round with the Sectional Medical Officers I always found some of the Volunteers on their rounds though they had no previous intimation of my intention to visit them.”

The work of the Volunteers in A Ward, too, was excellent. There were only 2 Committees, one for the Fort and one for Colaba, comprising 28 gentlemen. They reported 487 cases or 32 per cent. of the total found, and there were some of them who did their work with unbounded enthusiasm, devoting the whole of their leisure time to it. By keeping constantly in touch with the people, with the house-owners and bhayas (care-takers) they obtained a thorough knowledge of their beats, while some of them had great influence of their own as householders, leaders of their communities, or well-known medical practitioners. Thanks to their tact, good humour and kindness, not a single serious difficulty occurred in the plague administration of A Ward. In B Ward (North) there were 21 gentlemen who worked. They had an overcrowded, insanitary district to deal with, and never got such a hold upon it as was secured by those in A Ward. They did, however, from time to time, excellent work. It was marred occasionally by bickering, and a good deal of effort was required to work up any keenness among them. There were, however, one or two exceptionally hard workers, and the shortcomings of the Committees as a whole may be with some justice ascribed to the fact that the District Officer was so constantly changed. This was unavoidable. The following account is given by Lieut. Brackenbury of the work of Volunteers in B Ward (South).

“In June 1898 I found two Committees working in Mandvi and one in Chakla. The Committees in Mandvi were the Cutch Lohana and the Khoja (with a Sub-Committee for Jews). The Committee in Chakla was the Chakla Mixed (Hindu and Mahomedans). The Lohana Committee were supposed to look after the whole of Mandvi, *i.e.*, not only their own caste, but also the two very large castes



“of Baniyas and Bhatyas, not counting a small number of Marwaris, Guzeratis, etc.,  
 “as well as Ghattis and Kolies in Koliwada. Amongst these high caste Hin-  
 “dus it is only men of the very greatest influence who dare enter houses belong-  
 “ing to other castes. It is necessary here to state that in Mandvi people of differ-  
 “ent castes do not live together in the same house. In one house will be found  
 “only Lohanas, in another only Bhatias; and so on. It is not, therefore, to be won-  
 “dered at that this Committee failed to detect many cases. To meet these difficul-  
 “ties a Bania Committee was formed in November, and in January the Bhatyas  
 “organised a Committee. It was also found in Chakla that Mahomedans and  
 “Hindus did not work together satisfactorily, and separate Committees were formed.  
 “Thus at present the volunteers are thus organised :—

Name of Committee.	Section.	Chairman.	Number of Members.
Lohana ...	... Mandvi	... Rao Bahadur Caramsy Damjee ...	14
Bania ...	... ”	... District Officer ...	10
Bhattias ...	... ”	... Mr. Ranchordas Haridas ...	12
Khoja ...	... ”	... The Hon'ble Fazalbhoy Visram ...	2
Beni-Israel ...	... ”	... Khan Saheb David Solomon ...	2
Hindu ...	... Chakla	... Rao Saheb Gopaladas Kooshaldas ...	5
Mahomedan ...	... ”	... Khan Saheb Kazi Mahomed Ali Morgay ...	9
Total ...			54

The different Committees worked as follows :—

“*Lohana*.—A list of all the Lohana houses according to streets was made.  
 “To each member was allotted about a dozen houses. Care was taken that as far as  
 “possible a member was given those houses which were situated in the immediate  
 “vicinity of his own home. The duty of the members was to keep a watch on the  
 “health of the tenants of these houses. He was at liberty to examine the houses  
 “when and how he liked. This system was popular among the members.

“*Bania and Bhattias*.—At first it was arranged that these Committees should  
 “work on the same lines as the Lohana. But the Baniyas, on account of factions in  
 “the caste, could not be induced to work without the presence of the District Officer  
 “and staff, and the Bhattia members, on account of fear of the plague by the middle  
 “of February, had all left Mandvi. The members were, however, replaced by the  
 “caste servants, who were ordered by their employers to take note of all sickness  
 “they happened to see when visiting the houses for caste purposes. The great  
 “feature about this system of working is that the people are unaware that they are  
 “being watched. The appearance of these servants excites no curiosity among their  
 “own people. Among the Bhattias, I am sorry to say that the leaders sometimes for-  
 “bade their servants to speak the truth, and some deaths from plague were put  
 “down to “heart disease” or some such convenient malady.

“*Khoja*.—As a Committee, it did not exist. Mr. Fazalbhoy Visram, Mr.  
 “Chinoy and Mr. Habibbhoi could, however, always be depended upon to give in-  
 “formation of plague cases when they came to their notice, and as the community  
 “is very small no case could possibly happen without it coming to their notice.  
 “This only refers to the Khojas who live in Mandvi—a very small number.

“*Beni-Israel*.—Khan Saheb David Solomon is the only working member of  
 “this Committee. However, no other was necessary. I have always found him to  
 “work so well that I never now do more than mention what I want done, knowing  
 “full well he will do all I request him.



"*Hindu Chakla*.—This is the old-fashioned, hard working house-to-house-searching-by-members Committee. Each member twice a week. They slacked off certainly about April. I am inducing them gradually to teach the people to come to them to report sickness. It is, however, necessary to mention that the Khatris caste worked on the same lines as the Banias and Bhattias.

"*Mahomedan Chakla*.—These Mahomedans are divided into eight Mohallas, each being a separate community living together in one part of a street under its own jamayet, whose headman is a member of the Committee. Amongst them, however, are scattered Borahs and Memons. Haji Cassim Joosuf and Mr. Kurwa represent these. House-to-house visitation by members or jamayet servants is out of the question. The members, however, have very honestly reported all deaths in their Mohallas. This has enabled me to get at plague cases. Speaking generally, none of the members working in Mandvi believe that any measures are of any use. They are, however, all agreed on one point, viz., that when rats are dying in a house it is dangerous to live there. Their assistance, therefore, is not very cordial. Knowing their ideas on the subject I have made it my constant endeavour to make their work as little disagreeable as possible for them. In many instances they have doubtless presumed on my leniency and have knowingly not reported cases of plague, feeling assured that I shall believe (when death ensues) their tale when they say that they have known the case a long time, knew that it was "heart disease," but did not think the case serious enough to report. Members also don't care to help to persuade people to take their sick to hospital. In fact they have often done their utmost to get me to isolate the case at home. The Mahomedan members conceal out of sheer ignorance. They won't acknowledge any kind of plague besides bubonic, and only that when the type is very pronounced. Although the members of the Bhattia and Bania Committees and others of the same class are not of very much use in actively working, they have been of great assistance to me in various other ways, such as arranging for camps, hospitals, and especially in allaying the fears of the people."

In D Ward there were 160 Volunteers on the lists, but the value of their assistance was hardly proportionate to their numbers, and they were never successful in bringing to notice any large proportion of the plague cases that occurred. There were, however, a few who rendered valuable services. In E Ward (West) out of a total of 47 about 30 were most useful, and devoted as much time and attention to plague work as the best Volunteers in any district. In addition to finding and reporting plague cases, to persuading people to send their sick friends to hospital, and themselves evacuate infected rooms and houses, they gave valuable assistance by attending when houses had to be disinfected in the absence of owners, and thus satisfying people that no unnecessary damage would be done, and that the disinfecting gangs would be properly looked after. Finally they exercised a very complete supervision over all illness in their charges, maintaining a record of every sickness, and thereby very greatly strengthening the hands of the District Officer in his efforts to find and deal effectively with plague. In Byculla there were only 10 Volunteers, and some of these did little; but the few who really worked were of very great assistance in reporting plague and other sickness; while Mr. J. MacDonald carried his work further, and in many cases himself supervised the execution of the measures that had to be adopted. In the Wari Bunder District of E Ward there were

only 5 Volunteers, and it is obvious that they could not in any way take the place of an organized plague administration. They did, however, render invaluable assistance, Mr. G. Lund in especial taking upon him the responsibilities of an assistant District Officer, and almost entirely relieving the District Officer of his anxieties in connection with the Tarwari section. They all took a keen interest in pushing inoculation, and one of them, Dr. Pathare, whose death from plague was a severe loss, performed no less than 3,553 operations. Thanks to their efforts no district had more success in this direction.

The total number who volunteered at different times in F and G wards was 102; and of these about 50 worked steadily and well. The most successful were Rao Bahadur Vassanji Khimji's Committee in Dadar and Naigaum, Rao Saheb Sitaram Khanderao's in Sion, and Mr. C. Reel's in Worli. These Committees worked as well as any in the Island, their procedure was similar to that of the C Ward Volunteers, and their success as great. It was, however, obviously impossible for so small a number to adequately supervise the enormous area of this district, and though many worked hard in their individual capacity, the district staff had to rely to a large extent upon its own efforts.

Sirdar Mahomed Yakub's interesting account of voluntary work in the Central District is given below :—

"The Memons constitute one of the most important Mussalman communities in Bombay. For various reasons, plague work among them had been going on in an unsatisfactory manner. The Volunteers were doing little. House-to-house search by Volunteers was nominal or unknown, and although in September the mortality was as high as double the average, not a single plague case was reported nor was information of any case obtained from any other source. In one case only information had been got under exceptional circumstances. Within two weeks of the month of September in the Kolsa Moholla five deaths, one after another, took place in one house, and no less a person than the then Chairman of the Committee supported, before the District Officer, stories ascribing each death to a non-plague sickness. There were other Memon houses in which one death was followed by another or more in the same house, but they were always ascribed to causes other than plague. None of the four Moholla Hospitals of the Memons had been open, and no one had been sent to camp or hospital. The one patient mentioned above was segregated in his house. One Jamayet had, from the first, declined to form a Committee of Volunteers; the other Jamayets had separated from them owing to differences; and the leaders of the latter were, on the one hand, anxious that they should not do anything to incur displeasure of their people and, on the other hand, the people would not listen to the leaders, because they knew that their neighbours, —the rival Jamayet, — did nothing."

"When my district was formed on 1st November 1898 I had ascertained the principal causes which made the Memon community so backward in plague matters. On taking over the charge I convened a meeting of the Cutchi Memon Jamayet, in which not only the plague Volunteers assembled, but many more leaders of the Jamayet and the oldest members of their community also attended. This meeting was held at the house of the Chairman Mr. Abdool Rahiman. I addressed the Memon leaders assembled there, impressing on them first the paramount necessity of sincere obedience to the orders and desires of the ruling



“authorities, explained to them the advantages of the measures advised to be adopted, dwelt at length on the regrettable apathy evinced by their community and the bad name they were acquiring in consequence, not only for themselves, but for the Mussalmans in general, desired them to rise to a sense of duty, and pointed out that as the senior Jamayet they should lead the way towards the right path and should not be influenced by the conduct of others. Then I suggested to them that I intended to work through the leaders of the communities, and to leave to them as much as possibly could be done, pointing out that that had been my procedure in two previous epidemics in Karachi. I further explained that in pursuance of the wishes of the authorities I desired to show the utmost respect to the requirements of the *purdah* system and to their social and religious rights, and asked them to place confidence in me and to support me sincerely in the work in the success of which lay a good name for themselves and for the Mussalmans in general.

“The result of this meeting was encouraging. Warm assurances of their support were given by the leaders, and I have reason to be thankful to them for all that they were able to do from time to time among a community not at all easy to deal with. House-to-house visitations were recommenced by the Volunteers. The general tone of the Jamayet showed signs of improvement, and the leaders became distinctly regardful. The Chairman visited me daily at my office, and continued to do so even through the fasting month of Ramzan. He invariably accompanied me or Dr. Lewis, the Sectional Medical Officer, or the lady nurses for any inquiries or inspections which had to be made in his section ; even the disinfecting Inspector, whenever in need of assistance, went direct to him and obtained the required help.

“Noticing a certain degree of slackness in the month of March in reporting plague sickness, I spoke to the Chairman and sent word to two other gentlemen of influence, upon which they got together the leaders of the Jamayet, who worked with zeal, and in two or three days discovered 8 plague cases and got them removed. Very useful assistance was rendered in evacuation of infected rooms or houses or whole floors. This was carried out entirely by the leaders themselves, who also assisted the evicted people in securing vacant houses fit for their temporary occupation. I consider this to be a very satisfactory feature inasmuch as in the two previous epidemics evacuation of whole houses or removal from whole floors was not known among the Memons.

“The removal of the sick or contacts as a general rule was left to the leaders of the community, whether the case was discovered through information from any of the Volunteers or otherwise. In short, every thing which was done in the plague administration was done through the leaders of the community (most of whom were Volunteers), and on the whole I found them desirous to show that they were willing to exercise their influence so far as they could.

“The polite and cautious manner with which the arrangements were conducted by him brought so much popularity on the Chairman, Haji Abool Rahi-man, the principal worker in this important section, that his Community appointed him, in the month of March last, Joint Trustee of the Jamayet Funds, which is a coveted position.

“It may be remarked here that the foremost thing to be done with people whose susceptibilities are keen is to please their semi-religious or social sentiments to which they attach much value, and once their confidence is gained by little favours in this direction, popularity follows and co-operation in important matters is soon secured.



“*Kolsa Moholla Hallai Memons.*—The Jamayet of the Kolsa Moholla Hallai Memons was represented by a large number of Volunteers. Almost every one of influence was on the Committee.

“For some time after taking charge I found little or no improvement. As in other cases, I collected the Jamayet leaders, but all went to no purpose, and for a considerable time I could not well understand the difficulty. At last I learnt that there were certain elements of internal discord. These were removed when, on the resignation of the Chairman, on account of ill health, the patel, Haji Ibrahim Haji Sumar, succeeded to his place. The sense of the whole Jamayet was in favour of this measure and a marked improvement followed. The Jamayet as a body communicated its thanks to the authorities for it; and the leaders, specially the Patel, and his brother, commenced working on the same lines as the Catchi Jamayet. A desire to co-operate was generally evinced, and the change was marked and gratifying. The Sectional Medical Officer rightly said of it “I was working before as if I was working in darkness, and now I find sudden light thrown in the Kolsa Moholla.”

“The Khandwani Hallai Jamayet could not be induced to form a Volunteer Committee, but after several discussions they agreed to assist. Only one day after the promise of assistance, the leaders of this community opened their hospital and removed three patients to it. I count to their credit that they opened their hospital and contact house before the Kolsa Moholla Jamayet did, and as a prominent instance of active co-operation I always mentioned to the other Memons the case in which the relatives of a well-to-do plague patient were unwilling to take him to hospital, but Abdulla Mian Khandwani removed the patient to the Jamayet Hospital with determination, and behaved on this occasion as well as any of the most useful chairmen would have done.

“In a few words it can be said that the leaders of this Jamayet helped when help was required of them and did not show a spirit of opposition to the measures.

“Similar assistance was obtained from the Bhawnagri Memons Jamayet and the Khatri Memon Jamayet.

“*Kokni Mussalmans.*—The Koknis are the oldest Mahomedan inhabitants of Bombay, whose influence, not many years ago, was paramount among all the Mahomedans. They are originally Arabs who belonged to the party that waged war against the grandsons of the prophet, but when their influence was overpowered later on they were obliged to leave Arabia. They settled more than a thousand years ago at different places on the coast in the Konkan and afterwards in the Island of Bombay. The principal mosque in the city is still held in their trust; the principal Kazis or Moulvies who lead religious or social discussions are from their community. About nine-tenths of their population live in my district.

“Among the Koknis there is not a formal sort of Panchayet institution, but they have got their local Jamayets in the different localities, differing in functions from the Jamayets of the Memons. The majority of the Koknis follow the *purdah* system. The work among them was also as backward as among the Memons, and similar endeavours were made from time to time to secure the co-operation of the leaders of their Jamayets. No plague case had been reported, and their plague hospitals had not been opened. Matters improved in January, and evacuation of whole houses and removal of evicts from whole floors which had not been carried out before among these people was introduced through the assistance of the leading men.

“Mr. Budruddin Coor, J.P., whose name deserves prominent mention in this community, was particularly useful in this as in other matters. He rendered

“assistance not only among the Koknis, but also in the Khatri Memon Jamayet, who held him in much respect, as did the Hindus (mostly traders), who formed a considerable portion of the population of his section. His influence extended further to the Kokni Mussalmans in Khara Talao.

“In second Nagpada there are Deccani Mussalmans in large numbers, and K. B. Hakim Mahomed Daim and Mr. Kazi Kabirudin, Bar.-at-Law, are among them leaders of considerable influence. They have given from the first much assistance, and their Committee has worked with an unusual degree of activity.

“*Julahas.*—The Julahas (Weavers) belong to the North-West and the Central Provinces, and have settled in Bombay on account of the demand for saris, etc., woven by hand looms required by the Maratha and the Ghati population. As a class the Julahas are very poor, and they came with a reputation for gentleness which they have hardly maintained. During the year under report Khan Bahadur Abdul Razzak came forward as Chairman of the two Julaha Committees in which capacity he soon acquired, by his tact, great influence over the Julahas. I consider his work of the highest value. One section of the Julahas are Wahabis. They are fanatics and more difficult to deal with than the others. Although there was plague among them in the last two years evicts had not been removed, *i.e.*, whole chawls occupied by them had not been vacated. Considerable work of this kind has been done in this season among these people through Khan Bahadur Abdul Razzak, with the assistance of their headmen. As the Julahas lived in large over-crowded chawls considerable evacuation was carried out, and Mr. Abdul Razzak, with some Volunteers, always attended to see the evacuation conducted and remained there from the first till the last person came out. At one time, owing to the very heavy mortality, these people became very unwilling to take their patients to their Hospital. By persuasion and comforting assurances, and with the assistance of the leading men, the difficulty was got over, but in several cases K. B. Abdul Razzak had to go personally to arrange for the removal of the patients, with some of whom he went as far as the Hospital.”

Among other Mussalman communities with whom the Sirdar had to deal should be mentioned the Bohras, the Khojas, the Mogals, the Arabs, the Sidhis and the Pathans. None of these are numerous as compared with the classes already referred to, and no difficulty was experienced in dealing with them—thanks to the assistance of men of influence among them. The small European and Eurasian population in Byculla was adequately supervised by Col. Freeman (retired).

OF THE HINDUS IN HIS CHARGE, THE SIRDAR WRITES :—“About ninety per cent. are the poorest classes, mostly Ghattis, who are labourers, and low class Mochis and Mahars. These people live in ill-ventilated, dirty chawls, in which nothing can be seen without a lamp on the brightest day. Living on scanty and poor food, half clad and packed in the most miserable manner in dark and dirty rooms, they are naturally much more subject to the plague than any others.

“On the Parcel Road on both sides of the Bhendi Bazaar live better class Hindus; accordingly, I constituted a new Committee of Hindu Volunteers there, who performed their duties in a very satisfactory manner. The existing Committee in Old Nagpada (Umerkhadi) did most excellent work, and thanks to their unassuming hard work the plague administration here worked smoothly and efficiently and never had any trouble at all.



*General remarks with regard to work of Volunteers.*—"The work which lay before the Volunteers was by no means easy or free from difficulty. They had to deal with a fatalist population, a great portion of which does not believe in the advantages of the Plague measures. Many Volunteers and influential men personally inclined to be useful could not actively or openly do much on account of the prevailing conditions of the society in which their lot was thrown, where advancement towards enlightened ideas is slow, and it will not be for a long time that a true appreciation of their efforts is likely to be accorded. There are a good many instances of long enjoyed influence being lost on account of active assistance rendered in Plague measures. I shall mention a few prominent cases, and could add several more.

"A learned gentleman who passed among the Mussalmans as a religious dignitary and as a native physician of perhaps the largest practice, loyally and most sincerely assisted General Gatacre and Sir James Campbell, invariably accompanying them in their rounds. He brought to notice many plague cases, and in consequence lost nearly all his influence and more than half of his practice. Another gentleman whose influence had been unbounded among the Julahas has for his ready and true assistance during the last two years' epidemics, been hated by them more than he was popular before, and more than one other has for his honest endeavours in recent years to help the plague authorities reaped a harvest of hatred and abuse.

"So difficult sometimes is the position of the Volunteers rendered that the best of them on occasions do not desire that the assistance given by them in some matters be made known, and amusing instances not infrequently occurred of influential Volunteers using the most careful endeavours to avoid any open recognition of their assistance.

"Even among the medical profession and among men of learning and wide worldly experience there are people who do not believe in the usefulness or necessity of the Plague measures. We should, therefore, expect among the masses a large majority who are not satisfied with them but who only submit to authority. Among such people the part of the Volunteers is undoubtedly a difficult one, and we have to place much value on the assistance they have given us under these circumstances. If they have shown any shortcomings they should be closely looked into, and a good measure of them will be found to be due to causes over which they have not got full control. Whatever they have done has required from them the exercise of much tact, good temper and patience, the expense of time and personal trouble in the task of persuasion or inducement, and they have come forward to our assistance at no small amount of risk to their person, popularity and social relations. Through them we have worked smoothly and with reasonable efficiency. It is not a little gratifying that through their agency the measures of Government have been very much less unpopular in the eyes of the general public."

The great assistance rendered by the Volunteers was brought to the notice of Government, and their services were appreciated in Resolution No. 3733-P., General Department (Plague), dated 7th June 1899, which is printed below :—

**RESOLUTION.**—This report very fully justifies the hopes entertained by His Excellency the Governor-in-Council in March 1898, and shows how ready has been the response to his appeal for co-operation from all public-spirited citizens.

2. The list appearing below does not by any means comprise the names of all who have joined in the campaign against plague, but to many Government have in other ways conveyed approval of the good work they have done.



3. Such a campaign cannot be carried on without whole-hearted devotion to duties often monotonous, generally unpopular and always dangerous ; but those who have volunteered have for the most part carried them through with vigour and energy, with tact and discretion, and with complete disregard of the danger incurred : and it is largely due to the hearty co-operation of the volunteer workers that the measures devised to combat the plague have been carried out with so little friction during the past year.

4. Of those mentioned below, some by an enlightened exercise of their influence, by wise counsel or by personal example have done much to contribute to these results ; others have lavished money on the erection and maintenance of hospitals, or on the successful organisation and management of health camps ; most of the medical men on the list have been content to undergo a loss of private practice through their loyal devotion to the duties of good citizenship ; but the majority of those whose names are recorded have by cheerful, consistent hard work, and by the daily exercise of tact and firmness, won the confidence of the District Officers and reconciled the people to the measures concerted for the public good.

5. His Excellency the Governor-in-Council has keenly watched their efforts and now desires to convey to each and all of them the best thanks of Government and his hearty appreciation of the very valuable services they have rendered. Their names are here set forth :

Names.	Names.
<p>Sir Dinshaw Maneckji Petit, Bart.  Mr. Navroji Maneckji Wadia, C.I.E.  Sirdar Khàn Bahādur Mir Abdul Ali, J.P.  Professor O. V. Muller, J.P.  Mr. N. V. Mandlik, J.P.  Revd. R. M. Gray.  The Honourable Dr. Bhalchandra Krishna, J.P.  Mr. Adamji Peerbhoy, J.P.  Shams-ul-ulma Jivanji Jansetji Modi.</p> <p style="text-align: center;"><i>Ward A.</i></p> <p>Mr. K. R. Kama, J.P.  Khan Saheb Mahomed Faridudin.  Mr. C. Hummel.  Dr. N. N. Katrak, J.P.  Mr. Damodar Gordhandas, J.P.  Khàn Bahādur B. B. Patel, J.P.  Dr. D. N. Saher.  ,, B. N. Dorabshet, J.P.  ,, R. T. Nariman.  Mr. R. P. Karkaria.  ,, N. N. Guzdar.  ,, A. N. Guzdar.  ,, B. P. Dhondy.  ,, Hubert Crawford.</p> <p style="text-align: center;"><i>Ward B.</i></p> <p>Rao Bahadur Vithalrao Krishnaji Vande-  kar, J.P.  Mr. Ibrahim Rahimtulla, J.P.  ,, Ramchandra Vithalrao Vande-  kar.</p>	<p style="text-align: center;"><i>Ward B.—continued.</i></p> <p>Rao Saheb Balkrishna Bhivaji, J.P.  Mr. Joseph Ezekiel, J.P.  Khan Saheb Maneckji Jamsetji Chandana.  Rao Bahadur Karamsi Damji, J.P.  Rao Bahadur Keshavji Nathu Saelor.  Rao Saheb Vasanji Tricumji.  Mr. Narsi Keshavji.  ,, Lakbamsi Nappoo, J.P.  ,, Ranchordas Haridas.  Khan Bahadur Mahomed Ibrahim Husein  Baloo, J.P.  Dr. Khajah Abdulla.  Khan Saheb David Solomon.  Khan Saheb Kazi Mahomed Ali Saheb  Moorgay.  Mr. Ismaelji Ibrahimji Kurwa.  Haji Cassum Jusab, J.P.  Mr. Fazulbhoy Meherali Chinoy.</p> <p style="text-align: center;"><i>Ward C.</i></p> <p>Rao Bahadur Narayan Trimbak Vaidya,  J.P.  Dr. Cowasji Hormusji, J.P.  Rao Bahadur Bhaskerrao Balkrishnaji Pitale,  J.P.  Dr. Cowasji Pestonji.  ,, L. P. Pinto.  Rao Bahadur Ganasham Nilkant Nadkarni,  J.P.  Dr. A. G. Viegas, J.P.</p>

Names.	Names.
<i>Ward C.—continued.</i>	<i>Ward D.—continued.</i>
Rao Bahadur Dhakji Cashinath, J.P.	Dr. A. D. Modi, J.P.
Dr. P. J. DeSouza.	The Hon. Mr. N. G. Chandawarkar, J.P.
Mr. Harjivandas Sunderdas.	Mr. D. G. Padhye.
Dr. Dinshaw Bamanji Master, J.P.	„ Suffi O. Tayabji.
„ Bezanji Dadabhai Kapadia, J.P.	„ P. R. Wilson, J.P.
„ Ismail Jan Mohomed, J.P.	„ G. H. Farran.
„ Parshotam Harichand.	Lieutenant-Colonel T. A. Freeman.
„ S. S. Misir.	Mr. J. C. G. Bowen, J.P.
The Honourable Mr. Goculdas Kahandas Parekh, J.P.	Dr. M. D. Kama.
Mr. Vithaldas Pranjivandas Gungawala.	Mr. Allen F. Turner, J.P.
„ Vithaldas Jivandas.	„ Sundernath D. Khote.
„ Ranchordas Vallabhoy Shroff.	„ Amiruddin Tyabji, J.P.
„ Chunilal Nagindas Shroff.	Dr. Shantaram Vithal, J.P.
„ Dayabhai Tapidas Virajdas, J.P.	Khan Bahadur Byramji Dadabhoy, J.P.
„ Badrudin Abdulla Kur, J.P.	Revd. Dr. D. Mackichan.
Munshi Abdul Karim.	Mr. Nanabhai Rustomji Ranina, J.P.
Mr. Sarofally Mamooji.	„ R. W. L. Dunlop, J.P.
„ Abhechand Kasturchand.	„ P. B. Saville, J.P.
Rao Saheb Kanji Bhagvan Bhagat.	„ F. C. Macrae, J.P.
Khan Bahadur Fakirji Jiraji, J.P.	„ Damodardas Tapidas.
Rao Bahadur Manekchand Kapurchand, J.P.	„ M. D. Dadysett, Bar.-at-Law.
Mr. Amarchand Parmar.	„ E. Wilkins, J. P.
Khan Saheb Navroji Behramji Santook, J.P.	Khan Saheb Sheikh Abdulally Mulla Hiptoola Misir.
Mr. Nanabhai Sadanandji Kale.	<i>Ward E.</i>
Rao Saheb Purshotam Udhavji, J.P.	Khan Saheb Shaik Abdul Khadir.
„ Nanabhai Moroba.	Khan Saheb Kavasji E. Patel.
„ Narayen Ragnath Gorakshakar, J.P.	„ A. S. Moos.
Professor Shankar Abaji Bhise.	Rao Bahadur Ellapa Balaram, J.P.
Rao Saheb Mallooji Narsooji.	Mr. P. F. Bhandara.
„ Cashinath S. Moorkar.	Rao Saheb Dr. V. P. Chavan.
Khan Saheb Bhikaji Ruttonji Rana.	Mr. S. S. Somakh.
Khan Bahadur Darashah Rattonji Chichgar, J.P.	Khan Saheb Bhimjibhai Rustomji Ashburner.
Rao Saheb G. M. Dukle.	Khan Bahadur Samuel Isaji, J.P.
Mr. Parshotam Harilal Mohanlal.	Mr. George Lund, J.P.
Rao Saheb Shivalal Motiram.	„ James Macdonald, J.P.
Rao Saheb Mulji Narayen.	Rao Saheb Manooji Ragnuji.
Mr. Ramji Vella.	Mr. Janshetji C. Kharadi.
Rao Saheb Gopaldas Khushaldas.	„ P. C. Daruwala.
<i>Ward D.</i>	Rao Saheb Dalpatbhai Khandubhai Desai.
Dr. M. B. Colah, J.P.	Mr. P. J. Swami.
„ Framji Shapurji, J.P.	„ Lowji Meghji.
Khan Saheb Gulam Hussien Rogay.	„ Hassan Umar Jamal.
Mr. H. S. Dixit.	<i>Wards F and G.</i>
Dr. D. B. Naik.	Rao Bahadur Vassanji Khimji, J.P.
Mr. P. B. Joshi.	Rao Saheb Sitaram Khanderao.
„ D. N. Bahadurji.	Khan Saheb Shaik Adam Yusufbhoy, J.P.
	Mr. J. F. Madan.
	„ W. R. Jaykar.

Names.	Names.
<i>Wards F. &amp; G.—continued.</i>	Moulvi Hidayetullah, J.P.
Mr. A. N. Dalvi.	Mr. Ibrahim Adamji Peerbhoy.
„ C. Reel.	Haji Yusuf Haji Ismail, J.P.
Dr. D. A. DeMonte, J.P.	Haji Suleman Abdul Wahed, J.P.
Mr. S. W. Crichton.	Sardar Umar Jamal, J.P.
„ Dongarsi Bhimji, J.P.	Khan Saheb Syed Nissar Husein.
<i>Central District.</i>	Khan Saheb Haji Ibrahim Haji Sumar Patel.
Mr. Nazmudin Tyabji, J.P.	Khan Bahadur Haji Abdul Rahiman Haji Mohomed Kadwani, J.P.
Khan Bahadur Hakim Mahomed Dayan Hakim Abdulla Shah, J.P.	Mr. Sitaram Keshav Bole.
Mr. Kazi Kabirudin, Bar.-at-Law, J.P.	„ Hasanali Mahomedally Bambot, J.P.
Khan Bahadur Abdoor Razzak bin Curtas J.P.	Khan Saheb Hasanali Mulla Hakimji.
	Mr. Mohomedbhai Hasanali.
	Khan Saheb Haji Ishak Haji Isa.

Certificates of merit were also granted by His Excellency the Governor to the following gentlemen for their valuable plague services :—

Names.	Names.
<i>Ward A.</i>	<i>Ward B.—continued.</i>
Mr. Merwanji Dadabhoy Colabawala.	Mr. Gopal Damji.
„ Paidal David.	„ Nanabhai Kashinath.
„ Mahomed Ibrahim Mahomed Miyan Sendolay.	„ Ranchordas Vandrawandas.
„ Harichandra Vishram Rajwadkar.	„ M. H. Nicholson.
„ Bashiruddin Nuruddin.	„ Parshotam Jadhavi.
„ Vittal Sayana.	„ Parshotam Ratansi Khimji.
„ Gopal Nagoo Patel.	„ Vaghji Bechar.
„ H. D. Shah.	„ Keshavji Kooverji.
„ Sorabji Edalji Mashliwala.	„ Dharsi Khetsi.
<i>Ward B.</i>	„ Ratansi Govindji Vaidya.
Mr. Krishnaji Annaji Halde.	„ Devchand Hariram.
„ Madhavrao Makand Sawant.	„ Hariram Punja.
„ Elijah Solomon.	„ Motiram Jadavji.
„ Muradali Jooma.	„ Anand Ramji.
„ Mirza Mahomed Shirazi.	„ Dharmaji Madhavrao Rokde.
„ G. Moses.	„ Keshavji Bhimji.
„ Shivram Vithal.	„ Hirji Ghellabhai.
„ Samuel S. Mazgamkar.	„ Khimji Hirji Kayani.
„ Vishram S. Naringrekar.	„ Jivraj Shamji.
„ Sakharam Vital Khandalkar.	„ Shivji Mulji.
„ Jaffer Canji.	<i>Ward C.</i>
„ Krishnaji Bapuji Hajib.	Mr. Julio das Neves Menezes.
„ Habibbhoy Cassumbhoy Ahmedbhoy.	„ Vasudeo Crushnath Abbaji.
„ Goverdhandas Haridas Vaidya.	„ Srinath Nanabhai.
„ Ahmed Dewji.	„ Ramdas V. Desai.
„ Dadu Mian Hiraji.	„ Madhavrao Bhai.
„ Fateh Mahomed Pir Mahomed.	„ Framji B. Cursetji Lilavwala.
	„ Lakhmidas Pragji Arsher.



Names.	Names.
<i>Ward C.—continued.</i>	<i>Ward C.—continued.</i>
Mr. Balaji Narayen Bhise.	Mr. Nazerally Camrudin.
Dr. Edalji Cowasji.	„ Harichand Tnlaji.
Mr. Madhaoram Hiralal.	„ R. P. Kamat.
„ Mohanji Pranjivandas.	„ Shamrao Dinanath Mankar.
„ Ravji V. Shankershet.	„ B. Bhawanishankar.
„ Vasantao N. Moroba.	„ Jagannath Raghoba.
„ Atmaram J. Kirtikar.	„ Kanji Malji.
„ Bhai Jivanji.	„ Bhagwantrao Moroba.
„ Nanoo Narayen Kothare.	„ Moreswar Harichandra.
„ J. B. Gazdar.	„ Ramkrishna Balaji.
„ Parbhudas Bhagwandas.	„ Ebrahim Ladha.
„ Ganpatrao Chintoba.	„ Ramji Laxuman.
„ Bhagwantrao Nanabhai Vagal.	„ Kanji Dosa.
„ Purshotam Bhai.	„ Makund Moroba.
„ Itcharam Surajram Desai.	„ Sunderrao Atmaram Mankar.
„ Shantaram Khatree.	„ Gajanand Ramchandra Dharadhar.
„ Ramchandra Sadanaji.	„ Vinayek Jotiram.
Dr. F. E. Madan.	Haji Jaffer Ali.
„ N. J. R. Sethna.	Mr. Parshotam Gopal.
Mr. Hormusji Sorabji.	„ Laldas Damodardas.
Khan Saheb R. D. Surveyor.	„ Laxman Parshotam.
Mr. P. B. Dantra.	„ Kesho Parshotam.
„ Ameer Khan.	„ Anandrao Sunkerji.
„ Shamrao Pandurang, J.P.	„ Nanabhai Gopinath.
„ Tulsidas Dhanji.	„ Jekisandas Hariwalabhdas.
„ D. H. Billimoria.	„ Vannali Jethabhai
„ B. A. Billimoria.	„ Damodardas Tricandas.
„ K. H. Billimoria.	„ Moreswar Harischandra.
„ Vasanji Parshotam.	„ R. G. Deshmukh.
„ Balkrishnaji Bhaskerrao Pitale.	„ Parshotam Bhagwandas.
„ Bapuji Dinanath.	Rao Saheb Ganpatrao Moroba Pitale,
Dr. Anant Narayen Sambare.	J. P.
Mr. Rustomji B. Paymaster.	Mr. Sitaram Yashwant Dabholkar.
„ Dadabhai N. Kairawala, J.P.	Dr. Motilal Harkisandas.
„ B. S. Pntlaji.	Mr. M. H. Mundiwala.
„ Jehangir Rustomji Master.	„ N. M. Arjani.
„ Wamanrao Nana Moroba.	„ D. Mulji Patel.
„ Dosabhai R. Kairawala.	„ Chiganlal Brijlal.
„ Nathoba Moroba Chinchankar.	„ R. Ghaswala.
„ Ramkrishna M. Chonkar.	„ Hiralal Parbhudas.
„ F. A. DeMonte.	„ Ishwardas Tribhowandas.
Dr. K. S. Engineer.	„ Shivdas Bhanabhoy.
Mr. Hoshangji Rustomji.	„ Ganpatrao Rewashankar.
Dr. John Da Cunha	„ H. Itcharam.
„ V. S. Diwan.	„ Nagindas Jamnadas.
„ Wamanrao Madhavrao.	„ Parmanandas Itchalal.
„ Jagmohandas Chabildas Merchant.	„ Chnnilal Cooberdas.
Mr. Rustomji Merwanji Master.	„ Jheena Bhai.
„ Purshotam Narayan Mulji.	„ Nanalal Lallubhoy.
„ Mathuradas Piraj.	„ Jakeria Bangi.
„ Jethabhai Anandji.	„ Siraklal Parshotamdas.
„ Ganpat Jagannath Parolkar.	„ Vithaldas Kalyanji.

Names.	Names.
<i>Ward D.</i>	<i>Wards F. and G.—contd.</i>
Mr. F. M. Banaji.	Mr. K. Y. Powar.
„ K. M. Ghodi.	„ R. K. Powar.
Dr. H. B. Naik.	„ W. H. Khare, B.A.
Mr. Kamrudin Amirudin.	Mrs. Drupatibai.
„ Navroji Dhanjibhoy.	Mr. Raghunath Ramji Bhorala.
„ B. Sakaramji.	„ F. M. Somwan.
„ Laxman Vinayekrao.	„ Mancherji Shapurji.
„ Jehangir Jijibhai Lam.	„ Dhondi Rama.
„ N. B. Jassawala.	
„ Hirji P. D. Adenwala.	<i>Central District.</i>
<i>Ward E.</i>	Haji Abdul Sattar Saheb.
Khan Saheb Pallanji Pestonji Raghina.	„ Fateh Mahomed.
Mr. Bawa Maganlal Pandia.	Mr. Patel Sulleman.
„ Dadaji Bhanaji Gaikwad.	„ Hashim Dada.
Rao Bahadur Kushaba Chapaji Kale.	„ Narayen Hari Sarve.
Rao Saheb Ghamaji Balaji Rukhare.	„ Deoji Bhikaji Pevekar.
Rao Bahadur Dhondiba Hanmantrao	„ Pandurang Parshuram.
Barde, J. P.	„ Abdulah Hussein Sidi Patel.
Mr. Tukaram Javji Chaudhri, J. P.	Syed Shababuddin Abdul Rahman.
„ Raghunath Babaji Malup, J. P.	Khan Saheb Saleh Mahomed Ibrahim.
„ Sadashiv Sakharam Hande Deshmukh.	Mr. Nawrozali Ladak.
„ Ibrahim Hafiz.	„ Mehram Khadabhai.
„ Hari Laxuman.	„ Kanji Odhavji.
„ Ganpat Annaji.	„ Vallabji Punjabhai.
„ Bhivaji Shivaji.	„ Ahmed Ismail.
„ Dhondiba Ganpat Annaji.	„ Narayendas Laxuman.
„ Narsoo Saiboo.	„ Mahomed Ali Tungekar.
„ Maloo Laxman.	„ Mahomed Ibrahim Tungekar.
„ Sivaji Lingu.	Haji Mian Dowray.
„ Abdul Karim.	Mr. Sharif Gulam Rasul Loday.
„ Mohomed Hussein.	„ Kasim Kurtay.
<i>Wards F. &amp; G.</i>	„ Abdulali Karimbhai.
Dr. S. S. Batliwala.	„ Abdul Husein S. Kamrudin.
Mr. N. M. Marshall.	„ Nur Ali Madarbux Chaudhri.
„ J. M. Aguiar.	„ Abdul Rahiman.
„ V. R. Laxuman.	„ Abdul Hussein Daudjibhai.
„ Ravji Raghunath.	„ Mian Saheb Mulla.
„ J. Barretto.	„ Sirdar Khotabux.
„ R. R. Bapasola.	„ Bala Bahauddin Khote.
„ V. R. Acharya.	„ Munshi Mahomed Ameer.
„ Narayen Moroba.	„ Shaik Usman Rafique.
„ Carrimbhoy Peerbhoy.	„ Mahomed Ibrahim Maktabe.
„ D. C. Athaide.	„ Abdul Rahiman Bakshoola.
„ Damodhar G. Kamat.	„ Yakubullah Habibullah.
„ Edalji Mancherji Joshi.	„ Karim Elahibux.
„ Harjivan Mulji.	„ Chhadan Yar Mohomed.
„ Bapuji Barjorji Screwala.	Sirdar Makhdoom.
„ J. F. Olivera.	Haji Ismael Budha.
„ Munshi Ibrahim Dadu.	Mr. Ibrahim Khan Mohomed.
„ Dewji Pardeshi.	Haji Hasham.
	„ Nawaz Adam.
	Mr. Mowji Hirji.

Names.	Names.
<i>Central District—contd.</i>	<i>Central District—contd.</i>
Mr. Usman Abba.	Haji Abdullah Khatib.
Haji Musa Haji Mahomad.	Mr. Babasaheb Dhamaskar.
„ Oomerkhan Yusufkhan.	„ Ahmed Saheb Mongay.
Mr. Bala Mian Mokadam.	„ Abdul Rahman Ibadullah.
„ Shalu Mian Fakir Saheb.	„ Bisheshwar Harishankar.
„ Shaikh Shoba Lala.	„ Murarji Sunderji.
„ Shahabudin Kirtikar.	„ Kutubudin Paloba.

There are a few names which, through an unfortunate omission were not brought to the notice of Government at the time of the publication of the above lists, and this opportunity is taken to make special mention of them. First and foremost is that of Mr. Tribhowandas Mangaldas Nathubhoy. His advice, assistance and influence have always been at the disposal of the authorities, but he has more especially identified himself with the Hindu Fever Hospital, and his liberal donations greatly contributed to the success of that Institution. Special mention should also be made of Dr. G. B. Kher, who, as Honorary House Surgeon of the same Hospital, has for three successive years thrown himself heart and soul into the philanthropic work he has undertaken, and of Mr. D. R. Bapat who has laboured in the same cause, and himself undertook to see to the performance of the last rites in respect of the unclaimed bodies of any Brahmins who might succumb to plague. Among others whose names should have been brought to notice for the valuable assistance they have rendered in different parts of the city are :—

- Mr. Morarji Nensey, working in B Ward.
- „ Vamanrao Damodarji Pitale in C Ward.
- „ Gopinath Atmaram in E Ward, and
- „ Krishnarao Narayen Mahale in F and G Wards.

Sirdar Khan Bahadur Casim Haji Mitha also deserves mention for his generous contributions to various plague hospitals and camps. His liberality enabled assistance to be given to the distressed families of plague employés who died in Municipal service, but had not, under the rules, earned any compassionate allowance for their dependants.



## CHAPTER VIII.

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### Staff and Expenditure.

**Staff.** The following statements A and B show the maximum plague staff engaged during the past epidemic in the special plague department and in the ordinary Municipal departments respectively. This does not include the Special Medical Officer, the Deputy Commissioner or the Military Officers paid by Government. It will be seen that during the month of March, to which the statements refer, there were in the special plague department 1,724 persons employed on salaries aggregating Rs. 35,123-4, and in ordinary Municipal departments the extra hands temporarily employed on account of plague numbered 1,597 on salaries aggregating Rs. 26,194-4.

# STATEMENT

## The Maximum Special Plague

[illegible]

A.

## Staff during the third Epidemic

E. Ward East No. 9 District including Nariel- wadi & Ghorup- deo Camps.	Ward Bander Camp.	E. Ward West including Staff at the J. J. Hospital.	F. & G. Wards.	Maratha Hospital including Vapour Bath Treatment Staff.	Modikhana Hospital including Camp.	General Mahomedan Hospital.	Julat Hospital.	Disinfection staff at Feras Road.	Staff for private camps.	Staff engaged at the cemeteries.	Total strength.	Amount.
												Rs. a. p.
.....	.....	Mr. R. H. Vincent.	.....	.....	.....	.....	.....	.....	.....	.....	3 at Rs. 150	450 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 110	110 0 0
Dr. R. V. Patel*	.....	Dr. C. L. DeAvoine.	Dr. Dadiburjor †	.....	.....	.....	.....	.....	.....	.....	18 " 250	4,500 0 0
.....	.....	" M. N. Kapadia.	" H.K. Tavarla	.....	.....	.....	.....	.....	.....	.....	9 " 200	1,800 0 0
.....	.....	" N. E. Chubb ..	.....	.....	.....	.....	.....	.....	.....	.....	6 " 150	900 0 0
.....	.....	.....	Dr. K. M. Pardhey	.....	.....	.....	.....	.....	.....	.....	1 " 120	120 0 0
.....	.....	.....	" Y. G. Apte.	.....	.....	.....	.....	.....	.....	.....	1 " 125	125 0 0
.....	.....	.....	" D. R. Dhabar	.....	.....	.....	.....	.....	.....	.....	1 " 270	270 0 0
Mr. S. N. Abadaa	.....	Dr. D. R. Khote ..	.....	Mr. E. H. Hate ..	.....	.....	.....	.....	.....	.....	1 " 250	250 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 182	182 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 200	200 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 150	150 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 120	120 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 150	150 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 100	100 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 100	293 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2 " + 1-8	125 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 125	125 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 100	100 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6 " 85	510 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 30	30 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 300	300 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 80	80 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 60	60 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 200	200 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 150	150 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3 " 75	225 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 60	60 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 40	80 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 80	80 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6 " 60	360 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2 " 50	100 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 45	45 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	23 " 40	920 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	22 " 30	660 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 20	20 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4 " 30	120 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6 " 30	180 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20 " 10	200 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 60	60 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 55	55 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3 " 50	150 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8 " 40	320 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2 " 35	70 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10 " 30	300 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13 " 25	325 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5 " 20	100 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 15	15 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 50	50 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 25	25 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 14	14 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 120	120 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 60	60 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4 " 40	160 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 35	35 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6 " 30	180 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2 " 20	40 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 15	15 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 25	25 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4 " 20	80 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	46 " 15	690 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 14	14 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 12	12 0 0
17	3	19	23	16	6	3	...	1	3	26	271	17,240 0 0

\* In addition to his pay he draws an inoculation allowance of Rs. 100 per month.

† Draws Rs. 10 more as house allowance.



## STATEMENT

Designation and pay of the appointment.	A. Ward including Vithal Sayana Camp and Crunkshank Road Camp.	B. Ward North including Elphinstone Bridge Camp.	B. South.	C. Ward including Gocul- das Tejpal Health Camp, Crawford Market and Kennedy Sea Face Camps.	Central District including Byculla Northbrook Garden, Umar- khadi and Khaddu Wadi Camps.	D. Ward including Chow- pati and Grant Road Health Camps.	E. Ward East No. 8 District including Arthur Road Dhobi Camp.
Brought forward ...	11	12	14	42	38	25	14
Office peon ... ..at Rs. 14	.....	.....	1	.....	.....	.....	.....
" ... .." 12	.....	.....	.....	.....	.....	.....	.....
" ... .." 11-8	.....	.....	.....	.....	.....	.....	2
" ... .." 11	.....	.....	.....	.....	.....	.....	.....
" ... .." 10	.....	.....	.....	.....	.....	2	.....
" ... .." 9	.....	.....	1	.....	.....	.....	.....
" ... .." 8	.....	1	.....	.....	.....	.....	.....
Hospital Assistant ... ..at Rs. 50×10	.....	.....	.....	.....	.....	.....	.....
" " ... ..at Rs. 45	.....	.....	.....	.....	.....	.....	.....
" " ... .." 40	.....	.....	.....	.....	2	1	.....
" " ... .." 30	.....	.....	.....	.....	1	.....	.....
" " ... .." 25	.....	.....	.....	.....	.....	.....	.....
" " ... .." 15	.....	.....	.....	.....	.....	.....	.....
Compounder ... .." 30	.....	.....	.....	.....	.....	.....	.....
" ... .." 25	.....	.....	.....	.....	.....	.....	.....
" ... .." 20	.....	.....	.....	.....	.....	.....	.....
" ... .." 15	.....	.....	.....	.....	.....	.....	.....
Ayah ... .." 15	.....	.....	.....	.....	.....	.....	.....
Ward boys ... .." 15	.....	.....	.....	.....	.....	.....	.....
" ... .." 12	.....	.....	.....	.....	.....	.....	.....
Cook ... .." 15	.....	.....	.....	.....	.....	.....	.....
" ... .." 12	.....	.....	.....	.....	.....	.....	.....
Dhobi ... .." 25	.....	.....	.....	.....	.....	.....	.....
" ... .." 15	.....	.....	.....	.....	.....	.....	.....
" ... .." 12	.....	.....	.....	.....	.....	.....	.....
Corpse-bearers ... .." 20	.....	.....	.....	.....	.....	.....	.....
Engine Drivers ... .." 30	.....	.....	.....	.....	1 (B. C.)	.....	.....
Coal man ... .." 12	.....	.....	.....	.....	1 (Do.)	.....	.....
Engine coolies ... .." 11-8	.....	.....	.....	.....	.....	.....	.....
" ... .." 9	.....	.....	.....	.....	.....	.....	.....
Tile Turners ... .." 20	.....	.....	.....	.....	.....	.....	.....
" ... .." 16-8	.....	.....	.....	.....	.....	.....	.....
" ... .." 15	.....	.....	.....	3	2	.....	.....
" ... .." 14	1	.....	.....	.....	.....	.....	.....
" ... .." 12	.....	2	.....	.....	.....	.....	.....
" ... .." 11-8	.....	.....	.....	.....	.....	.....	2
Lock Smith ... .." 20	.....	.....	.....	2	.....	.....	.....
" ... .." 15	.....	.....	.....	.....	.....	.....	.....
" ... .." 14	1	.....	.....	.....	.....	.....	.....
Coolies ... .." 15	.....	.....	.....	.....	.....	.....	.....
" ... .." 12	.....	.....	.....	.....	.....	.....	.....
" ... .." 11-8	.....	.....	.....	.....	.....	.....	1
Disinfecting coolies ... .." 11-8	35	18	53	185	77	117	39
Camp coolies ... .." 11	2	.....	.....	.....	.....	.....	.....
Disinfecting coolies ... .." 10	.....	22	.....	.....	.....	.....	.....
Ambulance coolies ... .." 11-8	8	9	8	21	6 (2 B. C.)	12	12
" ... .." 10	.....	3	.....	.....	.....	.....	.....
Contact coolies ... ..at 6 annas per day.	.....	11	12	.....	.....	.....	.....
" ... ..at Rs. 11-8	.....	.....	.....	8	.....	.....	.....
Camp coolies ... ..at 5 annas per day.	.....	.....	.....	.....	.....	.....	.....
Lamp man ... ..at Rs. 12	.....	.....	.....	.....	.....	.....	.....
" ... .." 11-8	.....	.....	.....	.....	.....	2	.....
" ... .." 10	.....	.....	.....	.....	.....	.....	.....
" ... .." 11	1 (C. R. C.)	.....	.....	.....	.....	.....	.....
" ... .." 9	.....	.....	2	.....	.....	.....	.....
" ... .." 3	.....	.....	.....	.....	.....	.....	.....
Kettleman ... .." 11-8	.....	.....	.....	.....	.....	.....	2
" ... .." 9	.....	2	.....	.....	1	6	.....
Chowkidar ... .." 15	.....	.....	.....	.....	.....	6	.....
" ... .." 9	.....	.....	2	.....	.....	.....	.....
Bhisti ... .." 15	.....	.....	.....	.....	.....	.....	.....
" ... .." 11-8	.....	.....	.....	1 (K. S. C.)	.....	.....	.....
Sweepers ... .." 11-8	3 (2 C. R. C.) 1 V. S. C.)	3 (E. B. C.)	.....	13	.....	.....	.....
" ... .." 9	.....	.....	.....	.....	17	2	.....
" ... .." 6	.....	.....	.....	.....	.....	.....	.....
Halalcories ... .." 11-8	3	3 (E. B. C.)	.....	9	5	3	.....
" ... .." 9	.....	.....	.....	.....	.....	.....	.....
" ... .." 6	.....	.....	.....	.....	.....	.....	.....
" ... .." 15	.....	.....	.....	.....	.....	.....	.....
Policeman ... .." 12-6	.....	.....	.....	.....	.....	6	1
Police Jamedars ... .." 35-12	.....	.....	.....	.....	.....	.....	.....
" Havildars ... .." 18	.....	.....	.....	.....	.....	.....	.....
" Ramosis ... .." 11-4	9	8	11	13	13	10	11
Total ...	74	94	104	297	164	192	84

A—Continued.

E. Ward East No. 9 District including Nare- adi & Ghorup- deo Camp.	Wari Bunder Camp.	E. Ward West including Staff at the J. J. Hospital.	F. & G. Wards.	Maratha Hospital including Vapour Bath Treatment Staff.	Modkhana Hospital includ- ing Camp.	General Mahomedan Hospital.	Jabal Hospital.	Di-infection staff at Fons Road.	Staff for private camps.	Staff engaged at the Genetrix.	Total strength.	Amount.
17	2	19	22	16	6	3	...	1	3	26	271	Rs. a. p. 17,240 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 at Rs. 14	14 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 12	12 0 0
3 (1 G. C.)	.....	1	.....	1	.....	.....	.....	.....	.....	.....	6 " 11-8	69 0 0
.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1 " 11	11 0 0
.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	3 " 10	30 0 0
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2 " 9	18 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 8	8 0 0
.....	.....	.....	.....	4	2	.....	.....	.....	.....	.....	7 " 60	420 0 0
.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1 " 45	45 0 0
.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	4 " 40	160 0 0
.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	2 " 30	60 0 0
.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1 " 25	25 0 0
.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	2 " 15	30 0 0
.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1 " 30	30 0 0
.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1 " 25	25 0 0
.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1 " 20	20 0 0
.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1 " 15	15 0 0
.....	3	.....	.....	14	4	3	3	.....	.....	.....	26 " 15	390 9 0
.....	4	.....	.....	30 (4 on the Vapour Bath T. Staff).	2	.....	6	.....	.....	.....	42 " 15	630 0 0
.....	.....	.....	.....	.....	11	5	.....	.....	.....	.....	16 " 13	192 0 0
.....	1	.....	.....	.....	2	.....	1	.....	.....	.....	4 " 15	60 0 0
.....	.....	.....	.....	3	1	1	.....	.....	.....	.....	5 " 12	60 0 0
.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1 " 25	25 0 0
.....	.....	.....	.....	3	1	.....	1	.....	.....	.....	5 " 15	75 0 0
.....	.....	.....	.....	.....	2	1	.....	.....	.....	.....	3 " 12	36 0 0
.....	.....	.....	.....	4	.....	.....	.....	.....	.....	.....	4 " 20	80 0 0
1 (N. C.)	.....	.....	.....	1	1	.....	.....	.....	.....	.....	4 " 30	120 0 0
.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	2 " 12	24 0 0
.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	2 " 11-8	23 0 0
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5 " 9	45 0 0
.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1 " 20	20 0 0
.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1 " 16-8	16 8 0
.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	6 " 15	90 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 14	14 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2 " 12	24 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2 " 11-8	23 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3 " 20	40 0 0
.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1 " 15	15 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 14	14 0 0
.....	.....	.....	4	.....	.....	.....	.....	.....	.....	.....	4 " 15	60 0 0
.....	.....	.....	.....	4	.....	.....	.....	.....	.....	.....	4 " 12	48 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5 " 11-8	57 8 0
34	3	68	50	11	3	.....	.....	4	.....	.....	693 " 11-8	7,969 8 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2 " 11	22 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	22 " 10	220 0 0
4	2	8	12	.....	6	.....	.....	.....	.....	.....	108 " 11-8	1,242 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3 " 10	30 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11 " 11-8	126 8 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12 " 0-6	4 8 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8 " 11-8	92 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	8	.....	8 " 0-5	2 8 0
.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1 " 12	12 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2 " 11-8	23 0 0
.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1 " 10	10 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 11	11 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2 " 9	18 0 0
.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1 " 3	3 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2 " 11-8	23 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9 " 9	81 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6 " 15	90 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2 " 9	18 0 0
.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	2 " 15	30 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 " 11-8	11 8 0
22	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	47 " 11-8	540 8 0
.....	.....	4	.....	.....	.....	.....	.....	.....	6	.....	29 " 9	261 0 0
.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	2 " 6	12 0 0
2	.....	4	.....	38	15	3	.....	.....	10	.....	85 " 11-8	977 8 0
.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1 " 9	9 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	2 " 6	12 0 0
.....	.....	.....	.....	.....	.....	.....	3	.....	.....	.....	3 " 15	45 0 0
.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	8 " 12-6	99 0 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*17 " 35-12	607 12 0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*17 " 18	306 0 0
12	4	10	30	3	4	2	.....	.....	21	.....	160 " 11-4	1,800 0 0
101	24	122	121	133	64	19	16	5	50	26	1,724	35,123 4 0

\* Not shown by wards.



## STATEMENT

## Maximum Plague Staff in different Municipal

Designation.	Health Department.					Road Hospital.	Bandora Slaughter House Hospital.	Parel Laboratory.	Research Laboratory and Inoculating Staff.	Department including Store Branch.	
	Head Office.	No. 1 Divn.	No. 2 Divn.	No. 3 Divn.	No. 4 Divn.						
Assistant Engineer ... ..	400	...	...	...	...	...	...	...	...	...	
Do. Chief Accountant ... ..	300	...	...	...	...	...	...	...	...	1	
Ayahs ... ..	15	...	...	...	...	9	...	...	...	...	
Bhistis ... ..	15	...	...	...	...	1	...	...	...	...	
Bicycleman ... ..	15	1	...	...	...	...	...	...	...	...	
Begaries ... ..	14	...	...	...	...	17	...	...	...	...	
Do. ... ..	12	...	...	...	...	4	...	...	...	...	
Do. ... ..	11-8-0	...	...	...	...	8	...	...	...	...	
Do. ... ..	10	...	...	...	...	...	...	...	...	2	
Do. ... ..	9	91	75	176	85	...	...	...	...	...	
Do. ... ..	6	26	17	80	46	...	...	...	...	...	
Do. ... ..	as. 7 per day	...	...	...	...	...	...	...	...	...	
Do. ... ..	" 6 "	...	...	...	...	...	...	...	...	...	
Do. ... ..	" 5 "	...	...	...	...	...	...	...	...	...	
Chowkidars ... ..	10	...	...	...	...	...	...	...	...	...	
Clerks ... ..	Extra allowance 100	...	...	...	...	...	...	...	...	1	
Do. ... ..	75	...	...	...	...	...	...	...	...	...	
Do. ... ..	70	...	...	...	...	...	...	...	...	1	
Do. ... ..	60	1	...	...	...	...	...	...	...	1	
Do. ... ..	55	...	...	...	...	...	...	...	...	1	
Do. ... ..	50	...	...	...	...	...	...	1	...	1	
Do. ... ..	Extra allowance 50	...	...	...	...	...	...	...	...	1	
Do. ... ..	45	...	...	...	...	...	...	...	...	1	
Do. ... ..	40	...	...	...	...	...	...	...	...	1	
Do. ... ..	35	...	...	...	...	...	...	...	...	2	
Do. ... ..	30	9	...	1	...	...	...	...	...	...	
Do. ... ..	Extra allowance 30	1	...	...	...	...	...	...	...	...	
Do. ... ..	25	2	3	2	2	1	...	...	1	...	
Do. ... ..	Extra allowance 25	...	...	...	...	...	...	...	...	1	
Do. ... ..	20	1	1	1	3	1	...	...	1	3	
Do. ... ..	Extra allowance 20	...	...	...	...	...	...	...	...	...	
Do. ... ..	do. 15	1	...	...	...	...	...	...	...	...	
Do. ... ..	do. 10	...	...	...	...	...	...	...	...	...	
Do. ... ..	do. 2-8	...	...	...	...	...	...	...	...	...	
Do. ... ..	do. 1-8	...	...	...	...	...	...	...	...	...	
Compounder ... ..	20	...	...	...	...	1	...	1	...	...	
Cooks ... ..	17	...	...	...	...	1	...	...	...	...	
Do. ... ..	15	...	...	...	...	1	...	...	...	...	
Do. ... ..	12	...	...	...	...	1	...	...	...	...	
Dhobis ... ..	20	...	...	...	...	1	...	...	...	...	
Do. ... ..	12	...	...	...	...	1	...	...	...	...	
Do. ... ..	10	...	...	...	...	1	...	...	...	...	
Drivers ... ..	12	...	...	...	...	...	...	...	...	...	
Do. ... ..	11-8	...	...	...	...	...	...	...	...	...	
Do. ... ..	Extra allowance 3	...	...	...	...	...	...	...	...	...	
Engineers ... ..	do. 16	...	...	...	...	...	...	...	...	...	
Do. ... ..	do. 14	...	...	...	...	...	...	...	...	...	
Do. ... ..	do. 12	...	...	...	...	...	...	...	...	...	
Firemen ... ..	do. 2-12-9	...	...	...	...	...	...	...	...	...	
Do. ... ..	do. 2-6-5	...	...	...	...	...	...	...	...	...	
Fitters ... ..	1 per day	...	...	...	...	...	...	...	...	...	
Foremen ... ..	Extra allowance 50	...	...	...	...	...	...	...	...	...	
Do. ... ..	do. 40	...	...	...	...	...	...	...	...	...	
Do. ... ..	do. 35	...	...	...	...	...	...	...	...	...	
Do. ... ..	do. 30	...	...	...	...	...	...	...	...	...	
Do. ... ..	do. 25	...	...	...	...	...	...	...	...	...	
Do. ... ..	do. 20	...	...	...	...	...	...	...	...	...	
Grave diggers ... ..	10	...	...	...	...	...	...	...	...	...	
Grooms ... ..	10	...	...	...	...	...	...	...	...	...	
Do. ... ..	Extra allowance 2	...	...	...	...	...	...	...	...	...	
Carried over ... ..	...	16	121	95	258	136	48	...	1	3	17

## B

## Departments during the Third Epidemic.

House Inspection Staff.	Drainage Depart- ment.	Commissioner's Staff.	Fire Brigade Staff.	Camps and Hos- pitals, excluding Arthur Road and Bundara Hospital.	Water Depart- ment.	Cemeteries.	Total number.	Total amount per month.	Names.
1	...	...	...	...	...	...	1	Rs. a. p. 400 0 0	Mr. J. D. Nadershaw.
...	...	...	...	...	...	...	1	300 0 0	„ Geo. Blackwell.
...	...	...	...	...	...	...	9	135 0 0	
...	...	...	...	...	...	...	1	15 0 0	
...	...	...	...	...	...	...	1	15 0 0	
...	...	...	...	...	...	...	17	238 0 0	
...	...	...	...	...	...	...	4	48 0 0	
...	...	...	...	...	...	...	8	92 0 0	
...	...	...	...	...	...	...	2	20 0 0	
...	...	...	...	2	...	...	429	3,861 0 0	
...	...	...	...	...	...	...	169	1,014 0 0	
...	30	...	...	...	...	...	30	406 14 0	
...	12	...	...	...	...	...	12	139 8 0	
...	38	...	...	...	...	...	38	368 2 0	
...	...	...	...	1	...	...	1	10 0 0	
...	...	...	...	...	...	...	1	100 0 0	Mr. Ruttonji Fardunji Khambata.
...	1	...	...	...	...	...	1	75 0 0	
...	...	...	...	...	...	...	1	70 0 0	
...	...	...	...	...	...	...	2	120 0 0	
...	...	...	...	...	...	...	1	55 0 0	
4	...	1	...	...	...	...	7	350 0 0	
...	...	...	...	...	...	...	1	50 0 0	Mr. Bal Nilaje Pitale.
...	...	...	...	...	...	...	1	45 0 0	
2	...	1	...	...	...	...	4	160 0 0	
...	...	3	...	...	...	...	5	175 0 0	
5	...	3	...	...	...	...	18	540 0 0	
...	...	...	...	...	...	...	1	30 0 0	
1	...	1	...	...	...	...	13	325 0 0	
...	...	...	...	...	...	...	1	25 0 0	
4	...	...	...	...	...	...	16	320 0 0	
1	...	...	...	...	...	...	1	20 0 0	
...	...	2	...	...	...	...	3	45 0 0	
...	...	...	...	...	...	1	1	10 0 0	
...	...	...	...	...	...	2	2	5 0 0	
...	...	...	...	...	...	2	2	3 0 0	
...	...	...	...	...	...	...	2	40 0 0	
...	...	...	...	...	...	...	1	17 0 0	
...	...	...	...	...	...	...	1	15 0 0	
...	...	...	...	...	...	...	1	12 0 0	
...	...	...	...	...	...	...	1	20 0 0	
...	...	...	...	...	...	...	1	12 0 0	
...	...	...	...	...	...	...	1	10 0 0	
...	...	...	...	1	...	...	1	12 0 0	
...	...	...	...	2	...	...	2	23 0 0	
...	...	...	7	...	...	...	7	21 0 0	
...	...	...	2	...	...	...	2	32 0 0	
...	...	...	2	...	...	...	2	28 0 0	
...	...	...	2	...	...	...	2	24 0 0	
...	...	...	48	...	...	...	48	134 4 0	
...	...	...	54	...	...	...	54	129 10 6	
...	1	...	...	...	...	...	1	31 0 0	
...	...	...	1	...	...	...	1	50 0 0	
...	...	...	1	...	...	...	1	40 0 0	
...	...	...	1	...	...	...	1	35 0 0	
...	...	...	1	...	...	...	1	30 0 0	
...	...	...	1	...	...	...	1	25 0 0	
...	...	...	1	...	...	...	1	20 0 0	
...	...	...	...	...	...	11	11	110 0 0	
...	...	...	1	...	...	...	1	10 0 0	
...	...	...	8	...	...	...	8	16 0 0	
18	82	11	130	6	...	16	958	10,482 6 6	



## STATEMENT

Designation.	Health Department.					Arthur Hospital.	Bandora Slaughter House Hospital.	Parcel Laboratory.	Research Labora- tory and Inocula- ting Staff.	Account Department including Store Branch.
	Head Office.	No. 1 Divn.	No. 2 Divn.	No. 3 Divn.	No. 4 Divn.					
Brought forward ...	16	121	95	258	136	48	...	1	3	17
Halalkhore Mucadums ...	15	13	14	13	8	...	...	...	...	...
Do. ...	14	...	...	...	10	...	...	...	...	...
Do. ...	11-8	20	20	17	83	...	1	...	1	...
Hamals ...	10	...	...	...	...	...	...	1	1	...
Hospital Assistants ...	25+25+10+10	...	1	1	...	...	...	...	...	...
Do. do. ...	25+25+10	...	...	...	...	1	...	...	...	...
Do. do. ...	30	...	...	...	...	1	...	...	...	...
Do. Report Bearer ...	9	1	1	...	...	...	...	...	...	...
Inspectors ...	200+50	...	...	...	...	...	...	...	...	...
Do. ...	125	...	...	...	...	...	...	...	...	...
Do. ...	100	...	...	...	...	...	...	...	...	...
Do. ...	80	...	...	...	...	...	...	...	...	...
Laboratory Boys ...	12	...	...	...	...	...	...	1	...	...
Do. do. Extra allowance ...	10	1	...	...	...	...	...	...	...	...
Lascars ...	10	...	...	...	...	...	...	...	...	...
Mason ...	1 per day	...	...	...	...	...	...	...	...	...
Medical Men ...	1000	...	...	...	...	...	...	1	...	...
Do. ...	500	...	...	...	...	...	...	1	1	...
Do. ...	250	...	...	...	...	1	...	...	2	...
Do. ...	200	...	...	...	...	...	...	...	3	...
Do. ...	150	...	...	...	...	...	...	...	...	...
Mochies ...	Extra allowance 2-12-9	...	...	...	...	...	...	...	...	...
Mucadum ...	20	...	...	...	...	...	...	...	...	1
Do. ...	12	15	28	14	10	...	...	...	...	...
Do. ...	as. 12 per day	...	...	...	...	...	...	...	...	...
Do. ...	" 10 "	...	...	...	...	...	...	...	...	...
Do. ...	8	...	...	...	...	...	...	...	...	...
Nurses ...	100+1½ per day	...	...	...	...	6	...	...	...	...
Do. ...	85	...	...	...	...	1	...	...	...	...
Peons ...	15	...	...	...	...	...	...	...	1	...
Do. ...	10	...	...	...	...	...	...	...	4	...
Do. ...	9	1	...	...	...	...	...	...	...	1
Do. ...	8	...	...	...	...	...	...	...	1	1
Do. ...	6	...	...	...	...	...	...	...	...	...
Do. ...	3	...	...	...	...	...	...	...	...	1
Ramosis, Police ...	11-4	4	6	11	4	4	...	...	1	...
Do. do. ...	13-8	...	...	...	...	...	...	...	...	...
Ratcatchers or Killers ...	12	2	2	4	3	...	...	...	...	...
Store-Inspector ...	Extra allowance 70	...	...	...	...	...	...	...	...	1
Do. Assistant ...	100+30	...	...	...	...	...	...	...	...	1
Sub-Inspectors ...	60	4	7	6	2	...	...	...	...	...
Do. ...	40	3	...	2	1	...	...	...	...	...
Do. ...	35	...	...	1	...	...	...	...	...	...
Do. ...	30	12	13	8	8	...	...	...	...	...
Do. ...	25	...	...	2	...	...	...	...	...	...
Do. ...	20	2	2	1	2	...	...	...	...	...
Do. ...	Extra allowance 10	...	...	...	...	...	...	...	...	...
Syce ...	10	...	...	...	...	...	...	3	...	...
Tindal ...	Extra allowance 7	...	...	...	...	...	...	...	...	...
Do. ...	do. 6	...	...	...	...	...	...	...	...	...
Do. ...	do. 5	...	...	...	...	...	...	...	...	...
Do. ...	do. 4	...	...	...	...	...	...	...	...	...
Do. ...	do. 3-3-2	...	...	...	...	...	...	...	...	...
Trip-markers ...	20	2	6	2	1	...	...	...	...	...
Veterinary Surgeons ...	Extra allowance 50	...	...	...	...	...	...	1	...	...
Ward boys ...	25	...	...	...	...	1	...	...	...	...
Do. ...	15	...	...	...	...	13	...	...	...	...
Do. ...	12	...	...	...	...	30	1	...	...	...
Total ...	18	199	195	340	258	116	2	9	18	24

## B—Continued.

House Staff.	Drainage Depart- ment.	Commissioner's Staff.	Fire Brigade Staff.	Camps and Hos- pitals exclud- ing Arthur Road and Bamuna Hospitals	Water Depart- ment.	Cemeteries.	Total number.	Total amount per month.	Names.
18	82	11	130	6	...	16	958	Rs. 10,482 a. 6 p. 6	
...	...	...	...	1	...	...	49	735 0 0	
...	...	...	...	...	...	...	10	140 0 0	
...	...	...	...	57	...	...	199	2,288 8 0	
...	...	...	...	...	...	...	2	20 0 0	
...	...	...	...	...	...	...	2	140 0 0	
...	...	...	...	...	...	...	1	60 0 0	
...	...	...	...	...	...	...	1	30 0 0	
...	...	...	...	...	...	...	2	18 0 0	
1	...	...	...	...	...	...	1	250 0 0	Mr. N. D. Katrack.
2	...	...	...	...	...	...	2	250 0 0	Messrs. M. M. Mistri & A. K. Dadachanji.
11	...	...	...	...	...	...	11	1,100 0 0	{ Messrs. P. A. Chenoy, J. H. Karanjia, N. J. Bilimoria, M. D. Mistri, F. M. Fitter, I. J. Pitre, M. V. Tilak, U. J. Van Ross, F. S. Bharucha, and B. A. Wadia.
1	...	...	...	...	...	...	1	80 0 0	
...	...	...	...	...	...	...	1	12 0 0	
...	...	...	...	...	...	...	1	10 0 0	
29	...	...	...	...	...	...	29	290 0 0	
...	2	...	...	...	...	...	2	62 0 0	
...	...	...	...	...	...	...	1	1,000 0 0	Dr. Galleotti.
...	...	...	...	...	...	...	2	1,000 0 0	Profs. W. M. Haffkine and Poverini.
...	...	...	...	...	...	...	3	750 0 0	Drs. Frazer, Shroff, and Quadros.
...	...	...	...	...	...	...	3	600 0 0	„ Mayr, Paymaster and Desai.
...	...	...	...	...	...	1	1	150 0 0	Dr. G. R. Tambay.
...	...	...	6	...	...	...	6	16 12 6	
...	...	...	...	...	...	...	1	20 0 0	
...	...	...	...	...	...	...	67	804 0 0	
...	2	...	...	...	...	...	2	46 8 0	
...	1	...	...	...	...	...	1	19 6 0	
...	2	...	...	...	...	...	2	31 0 0	
...	...	...	...	...	...	...	6	879 0 0	Mrs. Baker and Chrichton and Misses Yates, Beale, Eugen and Phillips.
...	...	...	...	...	...	...	1	85 0 0	
...	...	1	...	...	...	...	2	30 0 0	
...	...	1	...	...	...	...	6	60 0 0	
...	...	2	...	...	...	...	4	36 0 0	
...	...	...	...	...	...	...	2	16 0 0	
...	...	5	...	...	...	...	5	30 0 0	
...	...	...	...	...	...	...	1	3 0 0	
...	...	...	...	...	...	...	30	337 8 0	
...	...	...	...	...	...	8	8	108 0 0	
...	...	...	...	...	...	...	11	132 0 0	
...	...	...	...	...	...	...	1	70 0 0	Mr. H. Wald.
...	...	...	...	...	...	...	1	130 0 0	„ J. M. Govendor.
...	...	...	...	...	...	...	19	1,140 0 0	
...	...	...	...	...	...	...	6	240 0 0	
...	...	...	...	...	...	...	1	35 0 0	
...	...	...	...	...	...	...	41	1,230 0 0	
...	...	...	...	...	...	...	2	50 0 0	
...	...	...	...	...	3	...	10	200 0 0	
...	...	...	...	...	...	1	1	10 0 0	
...	...	...	...	...	...	...	3	30 0 0	
...	...	...	1	...	...	...	1	7 0 0	
...	...	...	1	...	...	...	1	6 0 0	
...	...	...	3	...	...	...	3	15 0 0	
...	...	...	7	...	...	...	7	28 0 0	
...	...	...	6	...	...	...	6	19 3 0	
...	...	...	...	...	...	...	11	220 0 0	
...	...	...	...	...	...	...	1	50 0 0	Mr. Sohrab N. Ranina.
...	...	...	...	...	...	...	1	25 0 0	
...	...	...	...	...	...	...	13	195 0 0	
...	...	...	...	...	...	...	31	372 0 0	
62	89	20	154	64	3	26	1,597	26,194 4 0	

Among the whole staff there were 40 cases of plague as follows :—

Medical Officers	...	...	...	...	...	...	2
Clerk	...	...	...	...	...	...	1
Ramosis	...	...	...	...	...	...	2
Mukadams	...	...	...	...	...	...	2
Coolies, Kettlemen, &c.	...	...	...	...	...	...	33
							40

A few black sheep had to be got rid of, but complaints were very rare. The staff on the whole worked zealously and well.

**Expenditure.** The following statement shows the booked expenditure on plague operations during the year ending 31st May 1899 :—

	Expenditure incurred by the Municipality.			Expenditure incurred by the late Plague Committee.			TOTAL.		
	Rs.	a.	p.	Rs.	a.	p.	Rs.	a.	p.
<i>Establishment.</i>									
Central Offices, Superior	5,510	1	1	588	5	4	6,098	6	5
Do. Subordinate	21,304	7	7	12	0	0	21,316	7	7
District Offices, Superior	78,612	1	4	12,490	14	2	91,102	15	6
Do. Subordinate	91,402	14	11	4,057	5	2	95,460	4	1
Hospitals, Superior	7,823	12	2	1,328	11	3	9,152	7	5
Do. Subordinate	40,501	7	9	3,468	12	3	43,970	4	0
Military, Naval and Police, Superior	.....			275	14	0	275	14	0
Do. do. Subordinate.	25,483	4	4	1,685	14	4	27,169	2	8
Labourers, Halalcores and Scavengers.	1,43,448	1	1	2,407	0	1	1,45,855	1	2
Tile turners	1,165	2	3	4,796	12	2	5,961	14	5
	4,15,251	4	6	31,111	8	9	4,46,362	13	3
<i>Establishment, &amp;c., recoverable from</i>									
Government	1,586	10	11	.....			1,586	10	11
Contingencies	36,556	13	5	17,535	15	8	54,092	13	1
Purchase of furniture	3,823	0	6	20,876	0	7	24,699	1	1
Hire of do.	16	0	4	863	9	3	879	9	7
Cooking utensils and table articles	52	7	6	521	10	0	574	1	6
Food supply, Segregation Camps	235	7	9	5,431	13	2	5,667	4	11
Do. Hospitals	40,716	13	5	6,894	2	5	47,610	15	10
Do. Observation Camps	237	13	1	Cr. 4,856	6	2	Cr. 4,618	9	1
Disinfectants	21,556	8	3	1,502	0	0	23,058	8	3
Lime	5,148	14	8	914	13	8	6,063	12	4
Clothing	11,714	8	4	1,258	1	10	12,972	10	2
Compensation for clothing	20	2	0	7	4	0	27	6	0
Do. for huts, sheds, &c.	2,550	13	9	.....			2,550	13	9
Medicines, medical instruments, &c.	25,905	8	9	2,640	9	3	28,546	2	0
Telephone connections and alterations.	234	4	0	.....			234	4	0
Carried over	5,65,607	3	2	84,701	2	5	6,50,308	5	7



	Expenditure incurred by the Municipality.	Expenditure incurred by the late Plague Committee.	TOTAL.
	Rs. a. p.	Rs. a. p.	Rs. a. p.
Brought forward ...	5,65,607 3 2	84,701 2 5	6,50,308 5 7
<i>Construction.</i>			
District offices and sheds ...	6,671 14 3	2,765 14 1	9,437 12 4
Observation Camps ...	1,241 7 4	12,706 1 0	13,947 8 4
Hospitals ...	20,998 15 5	4,541 8 8	25,540 8 1
Segregation Camps ...	13,468 7 4	1,70,719 5 0	1,84,187 12 4
Do. recoverable from Government ...	.....	18,915 0 2	18,915 0 2
Gratuity to patients ...	.....	41 13 0	41 13 0
Rent of ground, godowns, &c. ...	6,400 11 2	5,338 3 3	11,738 14 5
Railway Inspection ...	329 5 4	6,570 3 10	6,899 9 2
Road Inspection ...	1,051 0 2	2,636 8 8	3,687 8 10
Sea Inspection ...	.....	50 0 0	50 0 0
Observation Camps deducting food supply and construction ...	1,521 14 3	8,384 4 0	9,906 2 3
Assessment taxes ...	1,199 4 6	1,007 2 6	2,206 7 0
Lime washing labour and stores excluding lime ...	23,097 5 2	358 15 0	23,456 4 2
Pass work expenses ...	928 5 11	3,560 15 2	4,489 5 1
Cleaning and flushing drains and including extra allowances to Fire Brigade staff, purchase of hose, coal, &c. ...	51,999 3 10	.....	51,999 3 10
Cost of research as carried out at the Sewri lazaretto, including portion of Dr. Haffkine's salary, establishment, furnishing of his bungalow, &c. ...	8,866 12 1	.....	8,866 12 1
Removing silt, town-sweeping, &c. ...	Cr. 14,433 11 7	.....	Cr. 14,433 11 7
Cleaning, disinfecting and repairing fittings ...	105 0 0	.....	105 0 0
Stores, firewood for cremation of dead bodies, &c. ...	13,220 2 8	.....	13,220 2 8
Pulling down and burning condemned houses ...	390 0 5	.....	390 0 5
Providing sanitary arrangements and connecting Segregation Hospitals owned by Mr. Haji Cassum for Cutchee Baniyas, C. Memons, and V. Baniyas at Charni Road, Jakaria Masjid Street and Bhuleshwar ...	44 13 9	.....	44 13 9
Inspection of houses in different parts of the City ...	33,883 14 0	.....	33,883 14 0
Cost of Prof. Lustig's serum obtained from Italy ...	6,491 6 5	.....	6,491 6 5
Cost of preparing Lustig's serum in Bombay, including salary of Drs. Gallioti and Polverini ...	19,528 13 9	.....	19,528 13 9
Constructing manholes in Mandvi District ...	Cr. 580 11 3	.....	Cr. 580 11 3
Maharatta Hospital and Camp ...	14,883 7 6	8,479 12 6	23,363 4 0
Jain Hospital ...	.....	106 8 0	106 8 0
Modikhana Hospital, Parsi Ward ...	.....	396 4 5	396 4 5
Carried over ...	7,76,915 1 7	3,31,279 9 8	11,08,194 11 3

	Expenditure incurred by the Municipality.	Expenditure incurred by the late Plague Committee.	TOTAL.
	Rs. a. p.	Rs. a. p.	Rs. a. p.
Brought forward ...	7,76,915 1 7	3,31,279 9 8	11,08,194 11 3
<i>Construction—concl'd.</i>			
Arthur Road Relapsing Fever Ward...	.....	439 8 0	439 8 0
Cutting of service pipes and erecting standpipes and making re-connections, &c. ...	7,743 6 0	1,774 11 2	9,518 1 2
Law charges, General ...	.....	103 0 0	103 0 0
Mahomedan Hospital and Camp ...	1,314 15 3	1,654 7 9	2,969 7 0
Working expenses of the electrolyzer ...	142 4 1	.....	142 4 1
Making ambulances and carts ...	590 7 0	.....	590 7 0
Treating down-take pipes in various parts of the city ...	1,405 11 6	.....	1,405 11 6
Total Rs. ...	7,88,111 13 5	3,35,251 4 7	11,23,363 2 0
<i>Less—Credit on account of—</i>			
Miscellaneous receipts ...	7,746 14 0	361 12 0	8,108 10 0
Do. fines and penalties ...	340 2 8	18 15 0	359 1 8
Contribution by Government ...	•3,314 7 6	•34,877 8 5	38,191 15 11
	11,401 8 2	35,258 3 5	46,659 11 7
Total Rs. ...	7,76,710 5 3	2,99,993 1 2	10,76,703 6 5

\* These amounts were received on account of payment made from June to November 1898.

The extra labour involved to the Chief Accountant in dealing with these large amounts, in addition to the funds provided by Government for the erection of camps and the Discretionary Relief Fund, was very severe. The responsibility for the prompt supply of all stores indented for by the numerous offices also fell upon him; and had it not been for the unremitting hard work of Mr. Waite and his locum tenens, Mr. Pearson, and their staff, plague operations must often have come to a standstill.

## CHAPTER IX.

## Miscellaneous.

Attitude of  
the people.

Speaking generally, the attitude of the people in Bombay has been distinctly friendly towards the plague administration, during the past year, and a certain proportion have come to believe that some, at any rate, of the plague measures are useful. That which they could most clearly understand was the measure of evacuation of infected places. Cases occurred where people themselves took the initiative and asked for accommodation in the public camps; and it happened over and over again that they accepted the suggestion to turn out without any demur whatever. This ready compliance has been due partly to the bitterness of experience, partly to the growth of confidence in the Plague Officers, but very largely indeed to the co-operation of plague volunteers. But evacuation was a measure which was only pressed when several cases occurred in succession, and the people could realise the danger they were in, and even in such cases, limitless patience and a most persuasive tongue were often required.

It was, however, often found that the passive resistance sometimes made to this measure was fomented by the landlord of the house, or by the contractor to whom he had leased out the right of collecting rents. There is no doubt that the landlord class has been very severely hit by the visitation of plague. The exodus from Bombay empties their chawls of tenants; when plague occurs, the inevitable plague mark goes up to frighten away future tenants; when plague recurs their tenants are turned out *en masse* for a brief space, and often take the opportunity which evacuation gives them of removing all their goods and chattels from the reach of the landlord's custodian or bhaya, to find accommodation elsewhere, and leave behind them an unpaid bill for arrears of rent. On the top of this repeated cases of plague in a house brings down upon them other calamities. The building is inspected and surveyed for sanitary defects, and sometimes it is condemned to be demolished altogether for a compensation that ignores the bloated rents secured through overcrowding, and sometimes the landlord is called upon to carry out improvements without any compensation at all. The insanitary conditions under which the people live is no doubt largely responsible for the afflictions which have visited Bombay, and the rapacity of landlords is doubtless worthy of condemnation, but self-interest is blind to considerations opposed to it, and though it is difficult to sympathise it is easy to understand the opposition of landlords to



plague measures, and very special credit is due to those few who have of their own free will assisted the authorities in evacuating their own chawls, or carried out suggestions for the improvement of their buildings.

It had been stated that people accepted evacuation without much trouble ; as a rule they accepted as inevitable the necessity of removing plague patients to hospital, when once the case came to the notice of the authorities ; but deliberate concealment of plague cases continued to occur, and though, in the absence of such an organised house-to-house visitation as obtained in the past, mere silence often sufficed to keep the authorities in ignorance, yet the assistance of the volunteers and the various methods adopted to obtain information of sickness forced those who could not bear the idea of sending their relatives to hospital to extraordinary devices. It twice happened that the District Staff, on going to remove a patient upon information received, found he had disappeared and eventually discovered him concealed in a tobacco shop among the tobacco leaves. It frequently happened that information was received of a plague case in a house with numerous rooms, and that all the rooms were carefully searched without result, until nothing remained except a few locked up on the outside, the tenants of which were said to have gone out to their work. These locked rooms had then to be opened, and the patient was often found in one of them ; and it sometimes happened that when a house was evacuated and every hole and corner turned out, patients were found concealed in unsuspected lofts. Lt. Warneford's remarks on this subject are very interesting, and are given in full.

"All persons suffering from plague would, I think, be kept concealed and hidden in their own homes were it not for the fear of the many direct and indirect agencies that we have for discovering them. So, taking this as my opinion, to the question, "to what extent are cases of plague now concealed"? I would answer that "every case is concealed," and it is only the knowledge that (through house owners, or neighbours, or friends, or medical attendants, or plague volunteers, or others), the plague officers will probably get to know about the sickness, and will come round to the house and see the sick person and probably remove him to a hospital ; it is, I think, only the knowledge and the fear of this that makes some of the people (a small proportion) remove their plague-stricken friends or relatives to a hospital at once. This is the class of case which we ordinarily call a "voluntary" removal, and such cases, in my experience, now number about 20 to 30 per cent. of the total of plague cases. A year ago, I do not think there were 5 per cent. of such cases, so in a sense things have improved in this respect, and there are now more of what are called "voluntary removals to hospitals." All other cases whether they come to the knowledge of the District Officer while still alive, or when dead, are what I would call strictly speaking concealed cases, that is to say—70 to 80 per cent. of the total. In my opinion this desire for concealment results from the wish of the patient himself to stay at home, and of his relatives (particularly the women of the family) to keep the patient at home under their own care and their own eyes. They do not understand, and they do not believe in the advantage to their relation of removal to a hospital—they consider that he has much more chance of recovery if they look after him, and keep him undisturbed in his own home. Whether plague infection remains with them and attacks the rest of the family or other persons in the house

they don't think about, nor if they did, would they care in the least. To sum up, I consider that if it were not for the various more or less forcible methods of persuasion on the part of the district officers, doctors, and volunteers, ninety-nine plague cases out of a hundred would be kept at home, and it is the wish and the effort to keep them at home that is the cause of concealment. Two other causes, but I should say comparatively minor ones, are—

- (1) The fear of the disturbance of the whole house and family by their removal as contacts.
- (2) The fear of damaging their property through disinfection; but I should say that neither of these operate so strongly as the wish to keep the son or daughter, husband or wife, under their own care and their own eyes.

“ Out of a total of 3,514 instances of plague reported in C. Ward, from June 1898 to April 1,899 inclusive, 1,985 came to our knowledge before death and were removed to hospital, and 1,529 were not known about until after death. That is to say that 1,529 instances were *successfully* concealed (*i.e.*, not removed to hospital or reported to any plague authority) until after death, and I would add that out of the 1,985 persons removed to hospital alive the great majority were concealed until they were found out.

“ As regards concealment of plague after death, I do not think that this has been successfully practised in C Ward. Owing to careful watching of ordinary sickness and investigation of causes of deaths, I think that very few persons who have died of plague have escaped being returned as plague and all necessary disinfection and segregation measures taken.”

Roadside cases of plague, whether sick or dead, are in some measure due to people refusing to believe they are ill and going about their business with plague upon them until they collapse; but cases undoubtedly occur, more especially among the labouring classes, many of whom come to Bombay to work for a few months only leaving their families at home, where, in order to avoid the attention of the plague authorities being called to the house in which they fell sick, the dead bodies of the plague stricken are taken out and thrown down in any open space, or more often hidden in the empty rooms of some vacated chawl that has not been securely locked. Instances were not uncommon of sick men being turned out of their houses by the landlord for similar reasons.

In such cases these unfortunates sometimes found friends who would take them in, care for them and conceal them, but more often they wandered about, as long as they could stand, and then lay down, either to die at once, or to be removed to hospital. The number of roadside cases was not so great as formerly: but there were as many as 130 in C ward and 118 in A ward. In F and G wards only 20 came to notice.

Every effort was made to make the public hospitals as popular as possible. Special arrangements were made to accommodate the families of patients close by, and visitors were freely allowed. But many disliked the idea of being placed in a ward with a number of others dangerously ill, and though in several hospitals this was in some degree mitigated



by the erection of screens and curtains, the arrangement was open to objection on account of its interference with ventilation. Nor was it possible to allow the relations of patients to crowd the wards and interfere with the doctor, or to feed them with unsuitable concoctions of their own, and these restrictions must remain and will always make hospitals to some extent unpopular with the ignorant. They had also the greatest suspicion of any serum treatment, and this gave a bad name to any hospital where it was resorted to.

**Captain Lock writes :** "The actual removal to hospital was undoubtedly a great source of dread, especially to some of the better classes—the poor took it for the most part apathetically, but to very many it was a dive in the dark; the patient feared death and the friends of the patient had no guarantee that the removal would be for the better, or confidence that the patient would be better treated than he would be in their care."

As in former years the sick vans of the Health Department became a terror in the eyes of the people, so do they now fear the ambulances. The Committee of the Colaba Volunteers more than once represented this, but were quite satisfied when they were told that a Health Department van would also be available if sent for. The fact is that any type of conveyance that is used for taking the sick to hospital is bound to become unpopular. People can persuade themselves that sickness is not serious, until the authorities step in and carry them off to hospital, and this, coupled as it is with the breaking up of the home and the transfer of the family to the hospital camp, is inevitably associated with the realization of their fears that the sickness is in danger of proving mortal.

**Captain Dunbar Stuart writes :** "They had some idea that the ambulance gave a shock to the patients that would kill them. In fact, they would rather walk to the Hospital."

And he had sometimes to take the ambulance to pieces to show the patient and his family that there was no trick in it; a belief obtained currency at one time in Byculla that patients were killed by electricity on getting into the ambulance.

The number of voluntary admissions to hospital was, however, very considerable during the year under report, and this indicates that the people have, at any rate to a large extent, got over their earlier fears.

**Lieutenant Brackenbury, D. O., B Ward South, writes :** "During the year there were 326 voluntary admissions into hospital, and 119 were reported by neighbours. Beyond these it may be taken for granted that the people would have concealed the remainder had they been able. In Mandvi the high caste Hindus conceal because they fear going to hospital, they dislike the discomfort of going to camp, and they hate the idea of having their houses interfered with for disinfection purposes."

The people of Mandvi are largely Gujarathi-speaking Hindus,—a class whose religious and social sensibilities are perhaps keener than



those of any other. They are well-to-do, but dislike going to hospitals, even their own; they would much prefer to die comfortably in their own houses surrounded by their relatives. They cannot bear the idea of their houses and kit being disinfected, partly because of the damage they think will be done and partly because of the halo of sanctity with which they endow all their belongings. The Mahomedans all over Bombay dislike going to hospital or camp, and in some cases showed a special aversion to disinfection with carbolic powder, and it required more patience and tact to overcome their objections than in the case of any other community. The Julahas were an exception to this rule, and very little difficulty was ever experienced in dealing with them; but this was largely due to the happy influence exercised over them by Khan Bahadur Abdur Razzak bin Curtas. Generally speaking all difficulties with the Musalmans were smoothed over with the assistance of their various leaders, but of these there were none in some parts of E Ward, and here occurred the only case in which actual resistance to our measures occurred during the year. A Mussalman assaulted a coolie engaged in evacuation work, and was convicted and fined Rs. 50. In two other instances in the same locality, the Mussalmans strenuously objected to the removal of their sick and other plague measures: but in the one case a small camp was erected for them with accommodation for patients at one end, and the whole Community then willingly turned out, and segregated their patients themselves, with the result that plague very soon ceased from among them. In the other case they were for a time allowed to put up temporary sheds of their own, with a separate shed for patients; but as the arrangement proved unsatisfactory and plague continued, a little pressure was brought to bear, the patients were sent to hospital and the healthy to camp. In a considerable number of other cases in other parts of Bombay, they began with violent opposition to the proposals of the District Officer, but were generally persuaded in the end to accept the most essential precautions. The measures adopted by Sirdar Mahomed Yakub in the Central District described elsewhere, show more fully the methods adopted and the success achieved with them, and at the same time throw much light on the attitude adopted by them.

In one case in Seori Koliwada, a village in the north of the Island, there was at one time passive resistance. The people, Kolis, refused to take their patients to hospital, to evacuate their houses, or take any measure to stop the spread of the disease. The District Officer, Capt. Lewis, with Lieut. Tristram, 2 Volunteers, the Medical Officer, and 2 ramosis went and tried to persuade them to do something, but they simply collected in the road and would do nothing. Under the circumstances the D. O. removed the patients, 3 in number, himself. Thereafter there was no difficulty.

The people brought their own patients, evacuated the village, and were most amenable.

The above remarks dwell principally upon the points wherein the people were disinclined to accept plague measures ; but as regards the general attitude of the people, there can be no question that they have lost their old hostility to the plague officer and all his works. When plague first broke out, Municipal servants had to face a storm of disapproval, and not seldom were hustled : later, house-to-house visitation parties were attended by police, or even by troops and evacuation was carried out with the assistance of sepoy and sailors and all the time the office files were crammed with complaints of every description. During the past year complaints have been rare ; and, except that a few police have occasionally been asked to be present at the evacuation of large chawls, or for the protection of property when a room had to be opened, the plague staff and the Volunteers have worked steadily on without any display of force whatever. This change has been due partly to the gradual education of the people by experience, but in very large measure to the voluntary co-operation of so many enlightened and public-spirited men from among them. The institution by leaders of various communities of private camps and hospitals is mentioned elsewhere ; the Parsee Panchayet also took special steps to encourage inoculation, and to help those in distress on account of plague. Leaders of the Daivadnya-Community issued a circular pressing upon their co-religionists the necessity of removal to hospital of plague patients and other measures, and advising inoculation, and their example was followed by the Jains and others. It was this public spirit among the natural leaders of the people which went furthest to reconcile the masses to measures unavoidably distasteful, and enabled the plague administration to proceed with so little friction.

**The movements of the people.**

Bombay was perhaps fuller than it has ever been before at the beginning of the past cold weather. The population was estimated at 9,50,000 ; it had undoubtedly been swelled to some extent by arrivals from Dharwar and the Southern Maratha country, and reports were more than once received of the great over-crowding of certain sections—notably Kumbharwada—by new arrivals. The approximate number of people in Bombay at the beginning of each month is given at the commencement of Chapter II of this report. There was a very large exodus during January, February and March, the returns furnished by the Collector of Bombay showing that in round numbers departures exceeded arrivals by 40,000, 77,000 and 82,000 in those months, respectively. The tide turned in April, and during that and the following month some 23,000 people came back. In addition to migration out of Bombay, there was a marked tendency among the better classes to remove themselves temporarily to the northern parts of the island. Large numbers from A, B and C Wards, probably in all some 25,000, took up plots of land in the low-lying fields of F and G Wards ; the diminution of population was specially noticeable in Mandvi.



**Plague at  
Bandora  
Slaughter  
House.**

At the end of July, the Executive Health Officer directed Capt. Lewis, D. O., F and G Wards, to detail a Medical Officer for the inspection of the butchers and others residing in the Slaughter House compound. Dr. Dadi Burjor was told off for this duty. Plague appeared in the second week of August, and cases occurred for six weeks as shown below.

Week Ending.	No. of Attacks.	No. of Deaths.
13-8-98	13	6
20-8-98	6	5
27-8-98	5	3
3-9-98	8	8
10-9-98	1	...
17-9-98	2	2
24-9-98	..	...
	<hr/> 35	<hr/> 24

The daughter of Mr. Saunders, Superintendent of the Slaughter Houses, was also attacked on the 11th September, but recovered after a severe illness.

A good deal of difficulty was experienced in getting the butchers to move their patients or do anything to stop the spread of the disease, but eventually matters were settled on a satisfactory basis, and the following arrangements were made : for the Mhars and low caste residents hospital accommodation was reserved at the South end of the Slaughter House. For the butchers and others, 16 rooms at the end of one of their chawls were reserved ; 12 for hospital purposes, and the remaining four rooms were kept open and unoccupied, so as to divide the hospital quarters from the remainder of the chawl.

A staff of one lady nurse, one local nurse, 2 ayahs, 2 ward-boys, 2 sweepers, 2 ramosis was engaged : and in addition to Dr. Dadi Burjor, Dr. DeMonte very kindly gave his services gratuitously in looking after the health of the people. This staff was dispensed with on 10th October. After September the Slaughter Houses were practically free from plague till the end of the year—one case occurred in January and one in March 1899.

**Railway and  
Causeway In-  
spection.**

The arrangements in force at the commencement of the year for the medical inspection of persons entering Bombay by road and rail have been fully described in Sir J. Campbell's Plague Report. They included inspection at both the Causeways, and at Sion and Victoria Terminus on the G. I. P. Railway, and at Bandora and Grant Road on the B. B. & C. I. Railway. At the beginning of June, plague had greatly declined in Bombay and Salsette and, with the approval of Government, inspection at Victoria Terminus, Sion, and Grant Road Stations, and at both the Causeways was stopped on June 15th. The medical inspection at Bandora continued, but its management was taken over by the Collector of Thana, and the inspection there, together with that of up-passengers at Kalyan, which had been arranged for by Government at the end of May, was deemed a sufficient protection for Bombay. On July 4th medical inspection of in-coming passengers was re-opened at Sion with



a staff of 4 Medical Officers, 8 subordinates and 3 Lady Inspectors. About this time there was a severe outbreak of plague at Danda, near Bandora, in the Salsette Taluka ; and in the absence of any Causeway inspection, the people came into Bombay in numbers on foot. A considerable number went to Mahim and Parel, but most of these were collected and sent back over the Causeway. Another party settled in, and infected Dharavi. The necessity of prompt measures to protect Bombay from this influx was apparent. The Causeway Inspections were accordingly reopened on 19th July, with a staff of 5 Medical Officers, 2 Clerks, 2 peons, 4 police havildars, 26 constables and a bhistie. At first the Causeways were entirely closed to inward traffic from 9 P.M. to 5 A.M., but in consequence of petitions from those interested in the green grass market, they were, on August 23rd, opened between 12 midnight and 2 A.M. an additional Medical Officer being engaged to enable the inspection staff to deal with the extra work. The whole of these inspections, including that carried out at Bandora under direct Government control, were discontinued on 13th October. The Officer in charge of the inspections arranged for by the Municipal Commissioner was, for practically the whole time, Lieutenant (now Captain) Lewis, D. O., F and G wards.

**General observations.**

There is a general opinion among those engaged in plague operations, that infection is not, except in pneumonic cases, readily conveyed from one human being direct to another. The rarity of cases in hospital supports this belief, and except where people recklessly handle and embrace the sick, without sanitary precautions of any kind, it is believed that the disease is more often contracted from infection lurking in the floors, &c., through some abrasion in the skin, and frequently through cracks in the skin between the toes. Infection may undoubtedly be carried in clothes and the like, and the movements of people from infected localities must often spread the plague, though those who take the disease with them may remain free from it themselves. The Surgeon in charge of one of the Plague Hospitals in Bombay, lived in pre-eminently healthy quarters. He daily returned to them, but appears, beyond changing his coat, to have taken very little precaution. His wife, a pure European, was attacked by a most virulent form of plague and died within 3 hours of the disease being definitely diagnosed. Another case was reported where 4 cases of plague were traced to mattresses which had been made out of cotton taken from the bedding of an infected house which had been pressed into a bale and sold.

The following case is quoted by Dr. Godinho :—

“ A large house in Narielwadi was almost vacant, on the ground-floor lived a Mahommedan family which consisted of 6 people, four children and the parents. One of the children went to a relation from whence he was brought back with fever. As the house was almost vacant and isolated, the child was allowed to remain at home. Within a week all members of the family took ill and were removed to hospital. The child was constantly embraced and kissed by the parents.”

The following by Dr. Shroff :—

“Dagdoo Laximan aged 8 years used to stay at his relatives somewhere in Mandvi, and at times used also to stay in this house No. 134-136. On 30th August this boy got an attack of fever and died on 1st September, the Plague Bubo developing before death. On the 1st idem other three boys, of nearly the age of the deceased, were attacked at the same place and removed to A. R. Hospital the same day. These three boys were sleeping with the deceased in the same room and almost the same bed and remained the whole time in close contact with the deceased. On the 2nd September Radhabai (the fifth case who was removed as contact to the same Hospital on the 2nd September) developed Plague symptoms and died there on the 4th idem.

“Thus the first case was an infected one and the infection was subsequently given to the other members of the family.”

These are instances where infection seems to have been passed from person to person ; but speaking generally, experience indicates that the danger is greater from being in an infected spot than from contact with an infected person.

The following statement shows, for each district, the number of houses in which one, two, and three or more cases respectively occurred :—

District.	No. of houses in which		
	One case.	Two cases.	Three or more cases.
A Ward ... ..	219	58	58
B Ward, South ... ..	285	104	112
B Ward, North ... ..	93	32	38
C Ward ... ..	not	supplied.	
D Ward ... ..	416	137	187
E Ward, West ... ..	343	154	168
E Ward, Byculla ... ..	not	supplied.	
E Ward, Wari Bandar ... ..	304	80	88
F and G Wards ... ..	not	supplied.	
Central District ... ..	415	116	155
Total ... ..	2,075	681	806

The above statement is not complete, but it shows roughly the proportion of houses in which plague did and did not recur. It is, however, almost impossible to deduce conclusions.

Each house has a separate population—one may be little more than a shed with room for 10 people, another will be a chawl accommodating upwards of 2,000—each house has a separate individuality in its structure and arrangements, in the matter of ventilation, water-supply and drainage, every house has a different sanitary environment, and the customs and manners of the residents vary according to their caste, class and position in life. Again the record only refers to cases definitely diagnosed as plague, and leaves out of count suspicious cases, and those where the cause of death was successfully misrepresented or the address successfully concealed.



The policy of evacuation of infected localities and houses is based on the almost universal experience that the principal danger in a plague epidemic is to be found in the infected locality—that the greatest safety lies in flight. Looking at the figures, such as they are, from this point of view, they seem to indicate a fair degree of success from the measures adopted : and when it is borne in mind that in large numbers of houses where two or more cases occurred, they were separated by such an interval of time as precluded the supposition that infection was passed from one to the other, and led rather to the inference that the patient had brought the disease in from outside, the case is better than the figures at first sight indicate. Captain Lock writes :—

“It is encouraging to report that temporary evacuation was found to stop the plague, and that it was very exceptional on the people being allowed to re-occupy that during the then present epidemic the house would be again infected. In this district evacuation and disinfection have been highly successful—second cases may have occurred in large houses, but have not been found to be in any way connected with previous cases in that house beyond the common cause of insanitation.”

Lieut. French writes :—

“It will be noticed that out of a total of 665 houses infected in as many as 343 houses only one case occurred. It must be borne in mind also that in those cases in which several deaths have occurred in a house or chawl, it does not follow that the house was badly infected, or that disinfection was not a success. The following is an instance. In one house 19 cases occurred. This looks at first sight a very large number, but when it is taken into consideration that between 2,000 and 3,000 persons reside in the chawl, it is not very large : as a matter of fact in many cases only one room was vacated, and this partial vacation and disinfection proved a great success, as the chawl was never badly infected. From the above figures and from personal observation I am thoroughly convinced that disinfection and evacuation have proved extremely effective in keeping the plague in check.”

Captain Wooldridge has great faith in the application of hot quick-lime subsequent to disinfection, and the following is extracted from his report :—

“House No. 251, Arthur Road, was thoroughly disinfected with perchloride of mercury solution, and this solution was used for 3 or 4 consecutive days, as the solution in use then was much weaker than that used at the present time. After the house had got dry, hot quick-lime-wash was used from top to bottom, with the result that no case has occurred since 20th September 1898.

“Again No. 7007, Haines Road, suffered a great deal in 1897 from plague—in consequence it was thoroughly disinfected as above, and there has been no recrudescence.

“House No. 28, Clerk Road, was also thoroughly disinfected with perchloride of mercury solution, and the one room in which the 8 cases occurred was flushed for 7 consecutive days, but no quick-lime was used, nor ordinary whitewash, and there was one fresh case in October 1898 and 2 cases in February and 2 in March 1899.

“No. 12, Clerk Road, was also thoroughly disinfected as above, and also more light and ventilation was given to the house, by putting in gratings in the passages and above the doors, but no quicklime wash was applied : a recrudescence occurred in



January 1899—only one month after evacuation. From the above it is apparent that disinfection must be carefully done, and when the house is thoroughly dry quick-lime wash must be applied throughout.”

It would be impossible to give the plague history of all infected houses in Bombay, or even of all the badly infected houses, but the following examples selected in the Central District and recounted by the Sectional Medical Officers are typical. They show in each instance the cases that occurred, the measures adopted, and how far they were successful.

*History of some of the Worst Houses.*

**Umarkhadi—  
Dr. Fazl Ahmed.**

1. *House No. 87, Tandel Street.*—This is the house which started the disease in the street. After the epidemic broke out at Coorla, a village in the Thana District, a Khojah merchant named Ahmed Shariff, who carried on his business at Goa, fled with his two daughters to Goa. When he arrived (passing on his way) at Bombay, he took up his residence in the house under report. He wanted to stop here for a few days and then leave for his destination. Two days after his arrival here, both of his daughters were attacked with plague on the 27th December 1898, and were removed to the Khojah Hospital. Ten days after this accident a third case occurred in the same house, and this was followed by two more on the subsequent day. The last two cases occurred on 8th January of the present year. The same day the house was disinfected and evacuated, and remained unoccupied for two months. The result was very favourable. There has been no death since then.

2. *House No. 49—51, Mahomed Khan Pakhadi.*—The first case of plague in this street occurred in this house. On 10th December two plague deaths were reported and verified in the house. On the 11th there again occurred one attack and one death. Whereupon the house was disinfected and evacuated. The tenants were so terrified that they dared not return to the house for three months. The result was very encouraging, as there occurred no case since the time the house was re-occupied, not even a natural death.

3. *House No. 432—434, Jakaria Masjid Street.*—In this house there occurred four seizures of plague in a day on 24th March 1899. They were removed to the Bhujwari Jamat Plague Hospital. The fifth attack occurred on 26th and the sixth on 27th of the same month, and all these patients were removed to the same hospital one after another. The house was disinfected and evacuated on the 28th, and remained vacant for a month. The result was very satisfactory, as no case occurred since.

4. *House No. 65, Kambekar Street.*—Early in February two cases occurred in a little house in Kambekar Street. The patients were servants of a respectable Memon. The first case occurred on 1st February and second on 3rd February. These two cases were followed by a suspicious death on 11th. The house was disinfected and evacuated on 12th. It remained unoccupied for ten days. The result was very successful, as there has been no case since.

5. *House No. 37, Mahomed Khan Pakhadi.*—The occupants are all Mahomedans of limited means. There occurred a plague case on 27th March and another two days after. No more plague was reported from the house, but suspicious deaths were continually reported one after another till the number reached eight. The occupants were asked to leave the house of their own accord, which they did on 12th, and re-occupied it on 20th. Since then no plague case has occurred.

*House No. 503, Parel Road, Umerkhadi.*—This is one of the largest houses in Parel Road, and is used as a carriage stable. It contains big chawls, all one-storied, and having lofts for keeping grass stacks. The ground floor is “kutchra,” filthy and wet. There are so many horses in the stable that it is very hard to keep it clean. Besides these chawls, there are a number of huts for the sweepers to live in. The chawls are overcrowded with inmates, men and horses. The men living in these chawls are generally Ghatia, with a small number of Mussalmans with equally filthy habits. They generally sleep on the ground and walk about bare-footed. They are poor and have to work very hard. There occurred twelve cases of plague in this stable. But all these cases did not really belong to the stable. Some of them were brought here from different parts of the City by their friends living here, while in one or two instances plague deaths occurred and no trace could be obtained as to where they came from.

There occurred twelve plague cases in the stable from 12th January to 20th May 1899, as detailed below :—

Date.	Cases.	Date	Cases.
12-1-99	1	15-2-99	1
23-1-99	2	17-2-99	2
24-1-99	1	23-2-99	1
27-1-99	1	1-4-99	1
14-2-99	1	20-5-99	1
	<hr/> 6		<hr/> 6

Every room in which a case occurred was disinfected and contacts removed. The evacuation of the whole stable was hardly possible.

*House No. 161, Parel Road, Umerkhadi.*—This is a very large house, having four stories with a very large number of rooms in each. The building is made of stone and brick, well cemented and properly plastered. The ground floor is slightly damp, but the upper floors are fairly dry. The rooms are nicely whitewashed, but with insufficient light and badly ventilated. The population of the house is about eight hundred souls. They are all Hindus, Banias, Marathas and Purdesis. Some are hawkers, others are shopkeepers and embroiderers. There occurred fourteen plague cases in the house, from 12th March to 25th May, as detailed below :—

Date.	Cases.	Date.	Cases.
11-3-99	1	24-3-99	1
12-3-99	1	4-4-99	1
16-3-99	1	8-4-99	2
20-3-99	1	19-4-99	1
22-3-99	1	24-4-99	1
23-3-99	1	25-5-99	2
	<hr/> 6		<hr/> 8

Disinfection was done in each case immediately after it had occurred. For every case three rooms were disinfected—one in which the case occurred and two adjoining rooms. The cases were very widely scattered in the different floors, and the evacuation of the whole house could not be effected. Therefore disinfection, removal of contacts and segregation of patients were the only plague measures adopted.

*House No. 85, Kambekar Street, Chuckla.*—The house is a “pukka” well built up and neat building, well ventilated and well lit up. The inmates are well-



to-do Cutchi Memons, with comparatively cleanly habits. The building is a three-storied one.

There occurred three cases in the house on 17th January 1899. The first man attacked was a servant who got fever on 15th, and the other two were laid down with fever on 16th. Plague symptoms appearing on the night of 16th, all three were removed to the Cutchi Memon Plague Hospital.

The fourth case occurred on 19th of the same month, that is, two days after the three first cases. The house was disinfected and vacated on 28th, and it remained unoccupied for a month. The result has been very favourable. No case has occurred since then.

This case shows how plague attacks the well-to-do Memon houses, that is, the servants are attacked first and then their masters.

**2nd Nagpada—  
Dr. Munjee.**

1. *House No. 30, Mustan Tank.*—The house is made of brick and wood. The ground-floor consists of earth and is consequently always damp. The other floors are made of wooden planks and earth. The house is fairly open on all sides and is not surrounded by high buildings. With all this, the two uppermost stories are very dark and ill-ventilated, in consequence of bad method of its construction, which does not provide sufficiently for light and air.

This house has twelve cases, the first occurring on 10th January 1899. Most of the cases were found on ground floor rooms. The infection began with three cases in the month of January, dates of which are as follows :—

First case occurred on 6th January 1899. On this day the infected room, together with two adjoining rooms on each side, was evacuated and disinfected. The tenants of the above rooms were sent to camps, where they were detained for about a fortnight. In the meantime, before the people returned from camps there was again a case on 10th January 1899. The same procedure of disinfection and evacuation was again resorted to. The third case took place on 24th January 1899. By this time all the people who were removed to camps had returned. The same procedure of evacuation and disinfection was again followed with the satisfactory result—though a short-lived one—that the infection stopped for about a month and-a-half. But again it made its appearance with increased virulence, at this time in the month of March, which witnessed six cases, dates of the cases being as follows :—

Two cases on 13th March 1899 ; three on 14th March 1899 ; and one on 15th March 1899. As each case took place, the method of disinfection and evacuation as stated above was strictly followed.

This had the effect of stopping the infection again for the second time for one full month. For the third time the infection was again noticed in the month of April, when three cases were discovered on the following dates :—two cases on 14th April 1899 and one on 25th April 1899. This time it was thought desirable to vacate and thoroughly disinfect the whole building. This rigorous procedure had a very satisfactory result, as even though the house was allowed to be reoccupied on 8th May 1899—after an interval of thirteen days' complete evacuation—no case has been discovered till now. In this house at least it cannot be said that the infection was kept up by the dirty habits of the inhabitants, for it is inhabited only by high class Mahrattas mostly belonging to the soldier class of former times. They observe a fair amount of cleanliness in their habits. The fault, in my opinion is due to the bad method of construction which allows very little of free air and light inside the rooms.



(2) *House No. 529, Duncan Road.*—This house is also built of wood and brick. The ground floor consists wholly of earth and is consequently very damp. This building consists of two main parts or chawls situated one behind the other, with an intervening open space of only about 3 yards. One of these chawls is open on three sides and faces the Duncan Road. It has a fair amount of light and ventilation, and was free of infection to a considerable extent as compared with the other chawl of the same building, which had three times more cases than the first one. The other hind chawl is very badly situated and is closed in on all sides except one, the western, with high buildings cutting off its supply of light and air. The ground-floor rooms are so very dark that even during mid-day we cannot see anything clearly without an artificial light. Out of the total 25 cases which were found in this whole building, as many as 15 were found in this chawl. Dates of the cases are as follows:—1st case on 9th December 1898 was found in the hind chawl. The infected room, together with the two adjoining rooms, was vacated and disinfected on 10th December 1898. People were sent to camps. The infection stopped suddenly and seemed to disappear for fully two months. The infection made its next appearance on the scene on the 7th February 1899, after an interval of fully two months. Six cases were discovered in the month of February on the following dates:—7th, 15th, 18th, 23rd, 27th and 28th February 1899. Each time the case was discovered, the necessary precaution of evacuation and disinfection of the infected rooms, together with two adjoining rooms, was observed in the strictest sense of the word, and yet the infection did not show signs of yielding. In the month of March the dates of the cases, which are in all 9, are as follows:—1st, 7th, 9th, and 12th March 1899; 2 cases on 15th March 1899; 2 cases on 20th and 21st March 1899. The rooms were again disinfected and vacated and contacts and evicts were sent to camps. In the month of April 5 cases were again found on the following dates:—2nd, 5th, 6th, 8th and 16th April 1899. But it may fairly be said here that the infection which began in this house on 9th December 1898 went on steadily progressing notwithstanding our energetic measures to stop it, till it reached its height in the month of March. From this time it began to show signs of gradual decline, till it almost subsided in the end of the month of May, which witnessed only 4 cases on the following dates:—4th, 10th, 29th and 30th May 1899. This house goes very much to prove that evacuation and disinfection does not necessarily exercise a check on the spread of infection. This house, and especially its back chawl, affords every facility for the sheltering of plague infection. Want of free air and light and dampness of its floors and walls, coupled with dirty habits of the inhabitants who are mostly low class Hindus, afford every opportunity for the microbial growth.

(3) *House No. 177, Grant Road.*—This house is a single storied house, consisting of two rows of rooms. It is also made of brick and wood with earthen ground-floor. It is surrounded on all sides by buildings of its own height. The house being a low one, gets a fair amount of light, but the bad method of its construction prevents free ventilation. It is inhabited by low caste Hindus—Mochis—who are extremely dirty in their habits. This house has 8 cases on the following dates:—30th December 1898; 16th, 18th, 22nd and 24th February 1899; 24th and 25th April 1899, and 18th May 1899. In this house the infection began on 30th December 1898, but was promptly checked apparently by thorough disinfection and evacuation of the infected and two adjoining rooms on each side. The infection which appeared to disappear quite, again broke forth in the month of February on 16th after an interval of full month and a half. As many as four cases were discovered in February, the last case in February being on 24th of that month. Again the infection stopped for full two months, after which it again

appeared in the month of April, which witnessed two cases on 24th and 25th. It again disappeared for 23 days, when one more case was noticed on 18th May 1899. From this date no case has been found till now.

(4) *House No. 8, Tank Street.*—It has only one big hall, made somewhat on the fashion of a stable, to tie horses in. It has no rooms, but has one storey which is very dark and low. It is made of wooden planks with earth plaster, and has small holes in the surrounding walls which serve the double purpose of bringing in light and air, if anything comes in at all. The ground-floor hall can, of course, be credited with having two fully-formed windows on each side of the main door facing the Tank Street, but these windows will only let in light for a very limited period of time—say, from 8 to 10 or 11 a.m. As for ventilation, it has supply of free air from being surrounded on all sides by high buildings (sic). It was inhabited by low class Hindus—Mochis—who have no idea of what cleanliness means. This house had 6 cases on the following dates:—7th, 13th, 14th and 15th March 1899; and 9th and 10th April 1899. The infection in this house began on 7th March 1899, which was followed closely by three more cases in the same month. Then it stopped for about 24 days and again appeared on 9th April. The house was vacated on 12th April and disinfected also on the same day. From this time it has not yet been re-occupied. Hence nothing further can be said about the progress of infection in this house.

**Khara Talao—  
Dr. Munshi.**

1. *House No. 255, Duncan Road, in Khara Talao.*—It is a three-storied house occupied by Hindu Mochis (shoe-makers), the most dirty people among the low caste Hindus. This house has no side gullies. Ground-floor has 6 rooms, the floor stone paved, but inside walls are made of wooden partitions. The 3 rooms at the back are absolutely dark and ill-ventilated. First floor has 6 rooms, the floor imperfectly cemented, and inside walls of the rooms are of planks. Second floor resembles the first floor in all respects. Third floor has 8 rooms, is very badly cemented, and is out of order. The rooms are of wooden partitions. On the 13th of February 1899 there occurred a plague case on the first floor, the infected room was vacated and the contacts were removed and disinfected on the next day. The 2nd case was discovered on the 17th of the same month on the same floor in the opposite room, which was also vacated and disinfected on the same day. The 3rd and the 4th cases of plague were discovered in one room on the second floor in one day on the 20th of February last. The room was vacated and disinfected on the very day. Finding that the progress of the epidemic was very rapid in this dirty house, the whole house was entirely vacated on the 23rd of February and disinfected on the 24th of the same month. It was re-occupied on the 8th March 1899 and there has been no fresh case of plague since.

2. *House No. 17-21, Duncan Road, in Khara Talao.*—This is a large three-storied house, occupied by Ghatees. Ground-floor has 10 rooms, partly stone-paved and partly earth (kacha). Inside walls are made of wooden partition and absolutely dark and damp inside the rooms. First floor has 12 rooms; though cemented but out of order. The inside walls are made of bricks. Second floor has 12 rooms and floor is cemented. Third floor has 9 rooms; the 3 front rooms are small, ill-ventilated and inside walls are pukka. On the 15th of July 1898, there occurred a plague case on the ground-floor. The room was immediately evacuated and the contacts were removed, and it was disinfected on the 16th idem. The 2 deaths from ordinary causes occurred on the first floor of this house, i.e., 1 on the 29th of July and the other on the 3rd of August last. After an interval of about a month from the date of the first plague case, the 2nd case was detected on the 13th August on ground floor. The room was vacated, contacts were sent and it was



disinfected on the following day. The 3rd case was reported on the 6th of September on the 1st floor, after an interval of 40 days. After this there was no case of plague in this house till the 20th of January 1899, when one fresh case of plague (the 4th one) was discovered on the same floor. The room was vacated and disinfected on the same day. The 5th case of plague was reported on the 2nd February last on the 3rd floor; the room was evacuated and disinfected on the 3rd idem. The 6th case was detected on the 5th of the same month, on the same floor; the room was evacuated and disinfected on the very day. The 7th case of plague occurred on 16th of March 1899, on the 2nd floor. The place was vacated and disinfected on the 17th of the same month. One more death from other causes was reported on the same floor on the 30th March. After an interval of 16 days, from the date of the 7th case of plague, there occurred 3 more cases of plague in one day on the ground-floor in one family on the 3rd April last. The room was as usual vacated and disinfected on the next day. This was followed by another case on the 5th April, on the same floor, in the last room, which was vacated and thoroughly disinfected on the 6th of the same month. This patient had no relatives to be removed as contacts. The last case of plague, *i.e.*, the 12th one, was discovered on the 1st floor of this house on the 9th April 1899. Finding that the progress of the epidemic was very rapid and no signs of abatement were shown, the house was entirely evacuated on the 9th April, the inmates were sent to Byculla Camp, and thoroughly disinfected on the 10th of the same month and the house closed. It was re-occupied by the old tenants, as well as the new ones, on the 22nd of April. There has been no plague case since then.

3. *House No. 2—16, Musjid Street Cross Lane, in Bhuleshwar Section.*—This is a very large one-storied chawl, occupied by Gujarati Mochis (shoe-makers). Ground floor has 10 rooms, the inside walls of which are of wooden partitions, and the floor is entirely earthy (*kucha*) and damp. First or the upper floor resembles the ground-floor in all respects. On the 20th of February 1899, 2 plague cases were discovered on the ground floor of this chawl. After making enquiries it was found that they were imported from Kalbadevi, Market Section, into this house. This formed the centre of infection, which rapidly affected the whole of the chawl. The same day another case of plague was reported and it was the 3rd case. The infected rooms were entirely evacuated and contacts removed and disinfected the same day. The 4th case of plague was detected on the 1st of March, and the 5th case, the next day on the same floor. The contacts were sent to public camps and the rooms were evacuated and disinfected on 2nd March. The 6th, 7th and 8th cases of plague were discovered on the 6th of March on the upper floor. The rooms were evacuated and disinfected the very day. The contacts were removed accordingly. The 9th case of plague occurred on the 9th of the same month. The room was vacated, contacts sent to camp, and it was disinfected on the very day. The last, namely, the 10th case was reported on the 16th of March 1899. Finding that case after case was occurring in this chawl, and the disease showed no signs of abatement, the house was entirely vacated on the 17th of March and disinfected on the same day. All the inmates of this chawl were removed to the public camps. It was re-occupied on the 30th of March and there has been no case of plague in this chawl since.

4. *House No. 106—108, Pinjrapole Street, in Bhuleshwar Section.*—This is a three-storied house occupied by the Baniyas, having no side gullies and is crowded in by the adjoining house to the east. Ground floor has 3 shops, well ventilated, but passage to the privies and water tap is entirely dark and having no means of ventilation and light. The floor is stone-paved, but it is out of order and hence the waste water soaked in which causes dampness. The first floor has 4

rooms, inside walls of which are of planks and the floor is cemented. The second floor has 3 rooms, well cemented, but the inside walls are of planks. The third or the top floor resembles the second floor in all respects. On the 19th of January 1899, 2 plague cases were discovered on the first floor of this house in one day, and the rooms were vacated, contacts were removed and it was disinfected the very day. After an interval of 14 days the 3rd case of plague occurred on the 2nd floor of this house on 2nd February 1899. The room was as usual vacated the same day and disinfected on the 3rd February. The 4th case was reported on the 3rd of the same month. After receiving information from the Lohana Hospital that one plague patient was admitted from this house, on enquiry I learnt that he was from the third floor of this house. The landlord and tenants of this house did not inform me about this case. I then ordered to disinfect the previously vacated room of this patient on the 3rd of the same month. Finding that case after case was occurring in this house which was occupied by a few persons, the whole was entirely vacated, except the ground-floor shops, on the 5th of February and thoroughly disinfected on the 6th of the same month. It was re-occupied on the 16th February, but after an interval of 6 days one fresh case of plague occurred on the first floor of this house on the 21st of February. After making deep and perfect enquiries, I learnt that this case was imported from Fanaswadi Section into this house. This room was again evacuated and disinfected on the 22nd of the same month. The 6th case of plague occurred on the third floor of this house on the 23rd of the same month. The whole house, considering it to be re-infected, was evacuated entirely on the 24th of February and thoroughly disinfected on the 25th of the same month. It was again re-occupied on the 10th of March 1899, and since then there has been no fresh case of plague.

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THE  
HISTORY OF THE  
CITY OF BOSTON  
FROM 1630 TO 1800  
BY  
JOHN H. COLEMAN  
IN TWO VOLUMES  
VOL. I  
BOSTON  
PUBLISHED BY  
J. B. LEECH, 1850

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PART II.

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# HOSPITALS

(Public and Private).

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FROM

W. L. HARVEY, Esq., I. C. S.,  
Municipal Commissioner,  
for the City of Bombay.

TO

THE PLAGUE COMMISSIONER

AND

CHIEF SECRETARY TO GOVERNMENT.

MUNICIPAL OFFICES,  
BOMBAY, *7th November 1899.*

SIR,

In continuation of my letter of the 19th October last, forwarding Part I of the Plague Report for the year ending 31st May 1899, I have the honour to forward herewith Part II, which relates to Hospitals and which has been compiled by Lieut.-Col. Wilkins, D.S.O.

2. The subject of the location of private hospitals, dealt with on page 153, has frequently been discussed, and I have authorized Col. Wilkins to use his influence to induce the Managers of these Institutions to have them removed to positions outside the densely populated portions of the native town. It is, however, probably impracticable to attain this result in all cases at once, and where the arbitrary closing of private hospitals would be likely to induce increased concealment of plague cases, I should consider it desirable, for the present at least, to keep them open.

3. I entirely endorse Col. Wilkins's remarks regarding the excellent work done by the Medical and Nursing Staff. They have laboured throughout the epidemic with the utmost zeal and devotion, and it is not too much to say that without the assistance of the trained nurses from England, a perfect standard of efficiency in the Hospitals would be difficult if not impossible to maintain.

I have the honour to be,

Sir,

Your most obedient servant,

W. L. HARVEY,  
Municipal Commissioner,  
for the City of Bombay.





**Summary of Report on all the Public and Private  
Plague Hospitals in Bombay during the Third  
Plague Epidemic, up to 31st May 1899.**

In compiling the Hospital Reports, I have been obliged to omit a large amount of information which has been contributed from the various hospitals, which information is, I think, unnecessary, because it has been carefully gone over in previous reports on plague ; also to condense, as much as possible, the material supplied. To enable this to be done, I thought it advisable to send to each hospital certain forms and questions which would make all returns on a uniform scale, and so enable me to compile these more easily, *vide* Appendix A. I have given more or less their own reports about each of the Public and Private Hospitals, which will enable us to see what work has been done by them.

There were 35 Public and Private Hospitals opened and working during this third epidemic in the City of Bombay. Out of these, the Public Hospitals were the Arthur Road, Modikhana, Maratha, Jullahi, Northbrook Gardens, and Strong's Hospital. The rest were Private Hospitals. There were 29 Caste Hospitals, 10 of which were for Mahomedans, 1 for Parsis, 1 for Jews, and 17 for Hindus.

There were 19 hospitals situated in the densely crowded part of the City ; 3 were situated in houses which had efficient ventilation and open space around, and 13 hospitals were in open sites and had plenty of air and space.

I have made short comments on each of these hospitals in the reports they published. The following points were asked to be reported on, *vide* appendix :—(2) A History of the Foundations of each Hospital with Staff and Committee, &c. ; (3) Hospital and Buildings ; (4) Conservancy ; (5) Water-supply ; (6) Disinfection of Wards and Clothes ; (7) Disposal of Dead ; (8) Notes on Haffkine's Inoculation ; (9) Sickness and Mortality amongst Staff of Hospital ; and a series of tables. Notes on various points of the disease, such as symptoms and treatment, incubation, temperature, buboes, complications, sequelæ, convalescence, &c., &c., were asked for. I have tried to condense the answers given to the above questions. The tables have been made out for all the hospitals.

**Hospitals.**

The following is the list of hospitals and their situation :—

1. Arthur Road.
2. Modikhana.
3. Maratha, Connaught Road, Byculla.
4. Jullahi Sunni Mahomedan, Ripon Road.
5. Northbrook Gardens, Grant Road.
6. Parsee Hospital, Parel Road.
7. Mahomedbhoy Ebrahim Khoja Hospital, Dondra Cross Lane.
8. Strong's Hospital, Colaba.
9. Port Trust, on the Frere Road.
10. Sarvajannic, Parel, Government House.
11. Adamji Pirbhoy, Charni Road.
12. Hindu, Charni Road Gardens.
13. Pathare Purbhoo, Charni Road Gardens.
14. Brahmoo Ksatrya.
15. Lund's Hospital, Mazagon.



16. Modh Purvad.
17. Kapol Ladh.
18. Thakurdwar Lohana, Thakurdwar Road.
19. Telugu, Kammatipura.
20. 3rd Bhoiwada.
21. Parel Jain, Parel Road.
22. Pinjrapol Jain, Pinjrapol Street.
23. Ksatrya.
24. Kokni, Parel Road.
25. Vasunji Tricumji, Olive Road.
26. Bhattia, Mint Road.
27. Bhois, Bhuleshwar.
28. Bene-Israel, Connaught Road.
29. Hallai Mehmon, Mehmonwada.
30. Cutchi Mehmon, do.
31. Katri Mehmon, do.
32. Kolsa Moholla, Kolsa Moholla Street.
33. Marwari Futti-pura, Pinjrapol Street.
34. Petit Mills.
35. Islami, Nagdevi.

The following tables have been compiled from information supplied by all these hospitals :—

TABLE I.—*Total Admissions during the Year.*

Name of Hospital.	Plague.	Relapsing Fever.	Observation Cases, including all General Diseases.	Total.
Arthur Road ... ..	1,470	1,436	346	3,252
Modikhana ... ..	1,262	107	497	1,866
Maratha ... ..	3,104	394	987	4,485
Jain Hospital, Lall Bag ...	286	.....	17	303
Bene-Israel ... ..	64	.....	23	87
Adamji Peerbhoy, Borah Fever Hospital ... ..	147	.....	25	172
Thakurdwar Lohana ...	151	.....	10	161
Kshatriya Fever Hospital, Churney Road Gardens ...	12	.....	.....	12
Bhois' Plague Hospital, Bhoiwada, Bhuleshwar ...	18	.....	2	20
Vassanji Trikamji ... ..	24	.....	1	25
Jain Hospital, Parel ... ..	243	6	8	257
Kolsa Moholla Mahomedan ...	7	.....	.....	7
Pathare Prabhu Hospital ...	36	.....	.....	36
Kokni ... ..	27	.....	1	28
Kapole and Lad Joint ... ..	92	.....	12	104
Third Bhoiwada ... ..	142	.....	2	144
Khatri Mahomedan ... ..	16	.....	1	17
Cutchi Memon ... ..	24	.....	.....	24
Mahomed Ebrahim Khoja ...	181	.....	18	199
Port Trust ... ..	148	7	23	178
Modh and Porwad ... ..	145	.....	.....	145
Telugu ... ..	245	2	9	256
Braham Kshatriya ... ..	54	.....	3	57
General Mahomedan, Northbrook Gardens ... ..	304	7	32	343
Hallai Memon ... ..	4	.....	.....	4
Sunni Mahomedan Jullahi ...	465	133	.....	598
Hindu Fever Hospital ... ..	250	.....	13	263
Parsee Fever Hospital ... ..	326	.....	81	407
Bhattia ... ..	141	.....	11	152
Mr. G. Lund's Hospital ... ..	17	6	14	37
Parel Sarvajani ... ..	540	5	56	601
Stuart Strong, Colaba ... ..	243	4	22	269
Petit Mills ... ..	22	.....	1	23
Total..	10,210	2,107	2,215	14,532

It will be noted that the Maratha Hospital has more than double the number of admissions from plague than any other Hospital, though the number of relapsing fever cases are far larger in the Arthur Road. The Public Hospitals have, as usual, had the heaviest admissions, though some of the Private Hospitals, such as the Sarvajannic (which opened rather late in the epidemic), the Parsee Hospital, the two Jain Hospitals, the Telugu, Hindu, and Strong's, all did good work. I had to issue very strict instructions to some of the hospitals who were inclined to admit other diseases, than plague or relapsing fever, into their wards. The tendency in some of these was to use these hospitals as ones for treatment of general diseases as well, but this was put a stop to as well as I could. These hospitals were generally divided into wards for observation cases—other diseases, such as relapsing fever, &c.—convalescent wards and plague wards, and some had separate accommodation for pneumonic cases. Of course, the men and women were kept separate. Every effort was made to carry out the above principles.

I regret to have to note the small number of admissions in the Mahomedan Hospitals situated in one of the densest parts of Bombay, *viz.*, the district between the Crawford Market, Parel Road, Frere Road, and Baboolia Tank Road. These hospitals, *viz.*, the Cutchi Mehmons, Hallai Mehmons and Katri Mehmons, ought to have shown a large number of admissions instead of the comparative small numbers quoted.

I think the work done in these hospitals, more especially the large public ones, is a matter of congratulation to the Staff and Committee.

With reference to the Private Hospitals which were opened in the very crowded part of the City, I may here state that I think it is now time, when our ideas of this disease are more advanced and the panic caused by the high mortality has to a very great extent subsided, that these were gradually abolished. It is well known amongst the medical profession that there is danger in placing infectious or contagious diseases in crowded parts of any city, and for this reason these hospitals are removed outside the crowded area and placed in open spaces away from the city. The Private Hospitals in Bombay were mostly in the densest part of the City. The control over these was not sufficiently careful, and I have no doubt the intercourse between the sick and their friends was much too free. Another point is that in a number of these Private Hospitals the buildings used as such were generally the places where caste meetings and other public ceremonies were carried out, and I think it will be admitted that once these places were used as Infectious Hospitals, it would not be wise to have them used again as public meeting places, where large number of men, women and children might meet and possibly get infected. I have been informed that it is very convenient to have these hospitals near where cases occur and that otherwise they would not go to hospital at all. I can instance the Maratha Hospital and the Arthur Road Hospital, also the Parsee and Jain Hospitals in the Parel Road where Hindus, Parsees and Brahmins, and other castes also, were brought from long dis-



tances to have their cases treated ; and given a comfortable method of conveyance, I cannot see why these cases should not be safely brought to hospitals outside the City, and so possibly save the City from having these probable centres of infection. When I state that there were 19 of these possible sources of infection, it will be seen that some steps ought to be taken to suppress this evil.

My own idea on the subject is that some open space, such as the Maratha Hospital grounds, or any other convenient site which might be selected, should be laid out as Large Plague Hospital. Small plots of ground enough to meet the requirements of each sect, could be handed over to them to build their own hospitals and contact camps. I need hardly point out the convenience of this arrangement. A staff of medical men and nurses could be employed to look after the sick and see that things are carried on properly. No interference with the prejudices of caste would be allowed, and the medical attendance and treatment could be left to the wishes of each caste, and the uncontrolled intercourse between sick and their friends avoided. The Maratha Hospital had its *vaidya* or native doctor. Those who wished it could have this form of treatment, and they were not interfered with in any way, except that the general sanitary conditions of these wards were attended to. Under these circumstances, the infected would be safely removed away from the City, and possible sources of infection removed. I think the Arthur Road Hospital should continue, and it is capable of enlargement so as to meet a larger demand on its resources. So also would, if necessary, the Modikhana Hospital, where there is plenty of open space for expansion. The Maratha to me is the ideal place, and if the ground were properly drained or raised, nearly the whole of the Hindu Hospitals could be placed comfortably there. I think the compact and well-conducted hospital, out-buildings and contact camps of the Pathare Parbhu as well as the Hindu Hospitals, both of which were situated in the Charni Road Gardens, a model on which these Hospitals should be instituted.

TABLE II.—Total Admissions to all Hospitals Month by Month during the Year.

Month.				Plague.	Relapsing Fever.	Observation Cases, including all General Diseases.	Total.
1893.							
June	...	...	...	69	124	65	258
July	...	...	...	125	120	98	343
August	...	...	...	306	184	148	638
September	...	...	...	480	288	130	898
October	...	...	...	371	278	134	783
November	...	...	...	147	125	101	373
December	...	...	...	381	179	207	767
1899.							
January	...	...	...	1,138	183	295	1,616
February	...	...	...	2,074	184	276	2,534
March	...	...	...	2,465	205	258	2,928
April	...	...	...	1,080	141	210	1,431
May	...	...	...	429	95	183	707
Grand Total				9,065	2,106	2,105	13,276

The above table is compiled from the returns made by 26 hospitals. Six other hospitals gave totals for 12 months only. If their figures be added, the grand totals would be :—

Admitted Plague, 9,663; Relapsing Fever, 2,106; Observation, 2,142; total 13,911.

The months of January, February, March and April have, as usual, proved the most virulent, and the sudden rise from 381 cases of plague in December to 1,138 in January, and the sudden decrease from 1,080 in April to 429 in May, is noticeable.

With regard to relapsing fever, there seems to be a practically uniform number of admissions during these months, except in September and October, and I can see no possible connection between the two diseases.

TABLE III.—*Plague (all Hospitals).*

Month.	Admissions.	Deaths.	Percentage of Mortality.
1898.			
June ... ..	69	31	44·9
July ... ..	125	78	62·4
August ... ..	306	181	59·1
September ... ..	480	316	65·8
October ... ..	371	256	69·0
November ... ..	147	101	68·7
December ... ..	381	247	64·8
1899.			
January ... ..	1,138	798	70·1
February ... ..	2,074	1,464	70·5
March ... ..	2,465	1,777	72·80
April ... ..	1,080	724	67·30
May ... ..	429	281	65·5
Grand Total ...	9,065	6,254	68·9

TABLE IV.—*Plague.*

*Total Admissions to each Hospital during the Year, together with Total Mortality and Rates of Mortality on Admission.*

Name of Hospital.	Admissions.	Deaths.	Percentage of Mortality.
Arthur Road ... ..	1,470	1,161	78·97
Modikhana ... ..	1,262	1,028	81·4
Maratha ... ..	3,104	2,509	80·8
Jain Hospital, Lall Bag ... ..	286	200	69·93
Bene-Israel ... ..	87	34	39·8
Adamji Peerbhoy Borah Fever Hospital ... ..	147	74	50·3
Thakurdwar Lohana ... ..	151	113	74·8
Kshatriya Fever Hospital, Charni Road Gardens ... ..	12	11	91·6
Bhois' Plague Hospital, Bhoiwada, Bhuleshwar ... ..	18	12	66·6
Vassanji Trikamji ... ..	24	18	75·0
Jain Hospital, Parel ... ..	243	194	79·8
Kolsa Moholla Mahomedan ... ..	7	3	42·8
Pathare Prabhu Hospital ... ..	36	26	72·2
Kokni ... ..	27	16	59·2
Kapole and Lad Joint ... ..	92	78	84·7
Third Bhoiwada ... ..	142	116	81·8
Khatri Mahomedan ... ..	16	9	56·2



Name of Hospital.	Ad- missions.	Deaths.	Percentage of Mortality.
Cutchi Memon ... ..	24	10	41·6
Mahomed Ebrahim Khoja ... ..	181	97	53·6
Port Trust ... ..	148	108	72·9
Modh and Porwad ... ..	145	109	75·1
Telegu ... ..	245	190	77·5
Braham Kshatrya ... ..	54	35	64·8
General Mahomedan, Northbrook Gardens ... ..	304	156	51·3
Hallai Memon ... ..	4	4	100·0
Sunni Mahomedan Jullaha ... ..	465	210	45·1
Hindu Fever Hospital ... ..	250	194	77·6
Parsee Fever Hospital ... ..	326	177	54·3
Bhattia ... ..	141	100	70·8
Mr. G. Lund's Hospital ... ..	17	13	76·4
Parel Sarvajanjik ... ..	540	374	69·2
Stuart Strong, Colaba ... ..	243	174	71·6
Petit Mills ... ..	22	16	72·7

If Tables II and III are compared with the general mortality return of the City of Bombay, the admissions and the rates of mortality will be found to rise and fall date for date as the general mortality rises and falls.

As noted before, not only does the plague increase during the months of January, February, March and April, but the tendency seems to be that the disease is more virulent also during these months.

In comparing this table in the three largest hospitals, *viz.*, Arthur Road, Maratha and Modikhana, it will be seen that the rates of mortality varies in the three hospitals, the Arthur Road showing heaviest percentage during September, October, November and January, the Modikhana practically agreeing with the Arthur Road, and the Maratha showing heaviest mortality in November, December, January, February, March and April.

I have personally watched the rate of mortality during the time I was in charge of the hospitals, *viz.*, from October to May, and my experience has been that the type of disease has been virulent all through this third epidemic, and I am inclined to agree with the results, as shown by the Arthur Road and Modikhana, which show more or less this heavy rate of mortality.

TABLE V.—*Plague.*

Months.	Total Admis- sions.	Died within 24 Hours.	Died within 48 Hours.	Total Deaths.
June 1898 ... ..	69	10	8	31
July " ... ..	125	31	16	78
August " ... ..	306	77	41	181
September " ... ..	480	140	67	316
October " ... ..	371	110	62	256
November " ... ..	147	53	18	101
December " ... ..	381	114	36	247
January 1899 ... ..	1,138	321	176	798
February " ... ..	2,074	561	337	1,464
March " ... ..	2,465	726	358	1,777
April " ... ..	1,080	264	173	724
May " ... ..	429	129	44	281
Total ... ..	9,065	2,536	1,336	6,254

This table is compiled from the returns given by 26 hospitals.

The enormous proportion of the deaths early in the disease is shown in this table.

TABLE VI.  
*Total Admissions to Hospitals during the Year, showing also the Effect of Age and Sex on Mortality.*

	Total Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Males ... ..	7,851	5,488	2,363	69·7
Females ... ..	2,557	1,531	1,026	59·4
Children (under 12 years of age) ... ..	1,453	704	749	48·4
Total ... ..	11,861	7,723	4,138	65·1

A few hospitals did not give this return. The figures include all diseases.

Table VI is interesting, showing the larger number of attacks of males as compared with women and children, and also the heavier rate of mortality amongst them.

*Castes.*

Admissions and Mortality, all Diseases by Sexes, &c.—Some Hospitals did not give this information.

TABLE VII.  
*Total Admissions to Hospitals of each Caste during the Year, showing also the Effect of Age and Sex on Mortality.*

HINDUS.

	Total Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Males ... ..	6,858	4,283	2,575	62·4
Females ... ..	2,129	1,228	901	57·0
Children (under 12 years of age) ... ..	1,172	524	648	44·7
Total ... ..	10,159	6,035	4,124	59·3

TABLE VII.—MAHOMEDANS.

	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Males ... ..	1,132	572	560	50·5
Females ... ..	428	157	271	36·4
Children (under 12 years of age) ... ..	270	77	193	28·5
Total ... ..	1,830	806	1,024	44

TABLE VII.—NATIVE CHRISTIANS.

	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Males ... ..	188	122	66	64·8
Females ... ..	43	26	17	62·7
Children (under 12 years of age) ... ..	16	8	8	50·0
Total ... ..	247	156	91	63·1

TABLE VII.—JAINS.

	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Males ... ..	476	345	131	72·4
Females ... ..	57	39	18	68·4
Children (under 12 years of age) ... ..	27	18	9	66·6
Total ...	560	402	158	71·7

TABLE—VII. BENE-ISRAEL.

	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Males ... ..	31	18	13	58·06
Females ... ..	19	9	10	47·3
Children (under 12 years of age) ... ..	17	5	12	29·4
Total ...	67	32	35	47·7

TABLE VII.—PARSEES.

	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Males ... ..	205	93	112	45·3
Females ... ..	147	72	75	48·9
Children (under 12 years of age)* ... ..	56	15	41	26·7
Total ...	408	180	228	44·1

Table VII is interesting, as giving a general idea of the mortality amongst the various castes. I am sorry to say some of the hospitals did not give this information.

The Parsees show the best percentage of mortality. The Hindus and Jains, who are practically vegetarians, show a high rate of mortality ; The Native Christians, chiefly composed of Goanese, also show a high rate of mortality ; these men are generally of very poor physique and are evidently unable to withstand the virulence of the disease.

TABLE VIII.—Table showing the Situation of Buboes.

Situation.	Total No. of Cases.	Males.	Females.	Children (under 12 Years of Age).	Deaths.	Recoveries.	Percentage of Mortality.
Cervical ... ..	525	343	156	26	264	261	50·2
Parotid ... ..	133	93	34	6	96	37	72·1
Right Axillary ... ..	919	631	260	28	722	197	78·5
Left " ... ..	849	567	262	20	667	182	78·5
Right Femoral ... ..	1,298	982	303	13	946	352	72·1
Left " ... ..	1,266	950	296	20	959	307	75·7
Right Inguinal ... ..	1,009	740	250	19	681	328	67·4
Left " ... ..	931	676	241	14	660	271	70·8
Other Situations* ... ..	124	79	38	7	66	58	53·2
No Buboes ... ..	1,515	1,235	264	16	1,318	197	86·9
Multiple Buboes † ... ..	924	564	327	33	632	292	68·3



This table is based upon the returns made by 28 hospitals. The figures in the column headed "Children," however, were returned by 4 hospitals only. In the remaining 24 hospitals the children are returned under the headings "Males and Females." The totals include males, females and children.

\* Described in hospital reports to have occurred, in order of frequency, in the following positions:—Supra-trochlear, Brachial, Sub-Maxillary, Popliteal, Occipital, Pectoral, Sub-Mental, Iliac, Pelvic, Calves of Legs, Cheek, Palm of Hand, Mammary, Upper Eyelid, Lumbar, and Hepatic.

† A patient at the Khatri Mahomedan Hospital had buboes in the following positions:—Left Cervical, Left Femoral, Left Tibial, Left Toe, Right Cervical.

#### *Buboes.*

*Order of Frequency.*—No Buboes, R. Femoral, L. Femoral, R. Inguinal, L. Inguinal, Multiple Buboes, R. Axillary, L. Axillary, Cervical, Parotid, other situations.

*Order of Frequency, Males.*—Same as above.

*Order of Frequency, Females.*—Multiple Buboes, R. Femoral, L. Femoral, No Buboes, L. Axillary, R. Axillary, R. Inguinal, L. Inguinal, Cervical, Parotid, other situations.

*Order of Frequency, Children.*—Multiple Buboes, R. Axillary, Cervical, L. Axillary, L. Femoral, R. Inguinal, No Buboes, L. Inguinal, R. Femoral, Parotid, other situations.

*In Order of Fatality.*—No Buboes, R. and L. Axillary, L. Femoral, R. Femoral, Parotid, L. Inguinal, Multiple Buboes, R. Inguinal, other situations, Cervical.

There seems to be no doubt from the return that the feet and hands are the primary sources of infection. In children I have chiefly seen the cervical and parotid varieties.

TABLE IX.—Table showing cases of *Pneumonic Plague* (without *Buboes*).

				Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Males	...	...	...	419	393	26	93·7
Females	...	...	...	111	98	13	88·2
Children	...	...	...	23	19	4	80·8
Total All Cases...				553	510	43	92·4

*Note.*—Only two of these cases were examined bacteriologically.

TABLE X.—Table showing Cases of *Plague complicated by Secondary Pneumonia*.

			Admissions.	Deaths.	Recoveries.	Percentage of Mortality.	Remarks.
Males	...	...	249	190	59	76·1	In the large majority of cases secondary pneumonia supervened on the third or fourth day after admission to hospital. One case was as late as the eighth day.
Females	...	...	74	56	18	75·6	
Children	...	...	27	16	11	59·2	
Total	...	...	350	262	88	74·8	

This most fatal disease is shown in Table IX. To get a fair estimate of these cases, I have asked the hospitals to include as plague pneumonia all cases that come in without any buboes and having lung mischief, and which died in three days. The usual course of the disease is death within three days. There is a very interesting case given in full by Dr. Parmanand of the Port Trust Hospital, which ended in recovery.

Secondary pneumonia or pneumonia supervening on plague is not nearly so fatal.

**Haffkine's  
Inoculation  
Cases.**

HAFFKINE.						
Total Cases admitted	...	...	...	...	...	82
Died	...	...	...	...	...	36

TABLE XI.

*Patients admitted to Hospitals who had been previously inoculated with Haffkine's Prophylactic.*

Hospital.	Name.	Caste.	Male or Female.	When inoculated	Admitted.	Result.
1. Arthur Road	.....	Surtee	Age. Male, 15 yrs.	12 Months before.	.....	D
2. Modikhana ..	Samuel John	Madras Christian.	Male, 26 "	3-2-99	23-2-99	D
3. Do.	Valentine Vaz	Christian.	Male, 17 "	15-2-99	16-3-99	R
4. Maratha ...	.....	Hindu.	Female, 30 "	A month before admission (2 c. c.)	26-2-99	D
5 & 6. Pathare Prabhu ...	.....	Do.	Male, 10 "	18-1-98	21-12-98	R
7. Mr. Lund's...	Rangia Khando	Do.	Male, 15 "	12-2-98	25-1-99	D
			Male, 24 "	4-9-98	4-10-98	R

Table XI is very interesting, as showing the cases that were stated to have had plague after inoculation with Haffkine's serum.

See also attached lists of cases at—

Parel Sarvajannik Hospital	7 cases.
Parsee Fever Hospital	24 "
Mahomedbhoy Ebrahim Khoja Hospital	44 "

Two cases at Parsee Fever Hospital had been inoculated with Yersin's serum and also with Haffkine's. They were treated in hospital by Lustig's treatment. One died, and one recovered.

**Parel Sarvajannik Hospital.**

Plague Cases admitted who had been previously inoculated by Haffkine. Details as far as known, are given below:—

Date.	Names.	Age.	Sex.	Attack.	Inoculated	Died.	Discharged.	Caste.
1. 28-1-99	Govind Mahadu	27	Male	26-1-99	12-18-98	1-2-99	...	Hindu.
2. 30-1-99	Baboo Vithu ...	16	Do.	29-1-99	No. 160	2-2-99	...	Do.
3. 4-2-99	Jairam Dhondur...	19	Do.	3-2-99	2-2-99	4-2-99	...	Do.
4. 8-2-99	Jeja Tukaram ...	20	Female	6-2-99	Not known	...	18-2-99	Do.
5. 10-2-99	Raghoo Atmaram	16	Male	8-2-99	Do.	...	18-2-99	Do.
6. 13-2-99	Dharma Sowar.	15	Do.	11-2-99	Do.	15-2-99	...	Do.
7. 8-4-99	Maruti Krishna.	25	Do.	7-4-99	Do.	...	14-4-99	Do.

## Parsee Fever Hospital.

*Inoculation by Haffkine's Serum.*

The following plague cases that were previously inoculated with Haffkine's serum were admitted ; their mortality was 37·5 per cent. :—

Name of the Patient.	Sex.	Age.	Date of Inoculation.	Date of attack.	Result.	Remarks.
1. Sunabai Dorabji Gadiali... ..	Female.	17Yrs.	Twice in Feb. 1898.	9th Dec. 1898	Cured.	
2. Boman Behman Irani	Male.	15 "	Apl. 1898.	6th Jan. 1899	"	
3. Rustomji Mervanji Bharucha ... ..	"	30 "	1896.	4th " "	Died.	Brought almost dying.
4. Gustad Behman Irani.	"	9 "	Dec. 1897.	21st " "	Cured.	
5. Cursetbai Cawasji Savedia ... ..	Female.	15 "	Feb. 1898.	1st Feb. "	Died.	Bubo not external.
6. Jamsetji Bomanji Kapadia ... ..	Male.	19 "	" "	4th " "	"	Had temperature 106·8°.
7. Maneckbai Bezonji Kapadia ... ..	Female.	18 "	" "	8th " "	Cured.	} Also inoculated with Yersin's serum on 21st Jan. 1899.
8. Sunabai Bezonji Kapadia, mother of the above... ..	"	45 "	" "	8th " "	Died.	
9. Pirozebai Jivanji Irani ... ..	"	13 "	Twice in 1898.	11th " "	Cured.	
10. Dadabhoy Edulji Nanjiwala .. ..	Male.	22 "	18-1-98 & 29-1-98.	17th " "	"	
11. Navazbai Ardeshar Baliwala ... ..	Female.	38 "	Feb. 1898.	19th " "	Died.	Comatose during all her illness.
12. Hormusji Ardeshar Baliwala ... ..	Male.	11 "	" "	19th " "	"	Son of the above; died of syncope.
13. Homar Manockji Gheesta ... ..	Female.	13 "	Jan. "	20th " "	Cured.	Mild attack.
14. Kharsedji Navroji Lungdana ... ..	Male.	25 "	1898.	26th " "	"	
15. Ratansha Rustomji Daruwala... ..	"	23 "	Feb. 1899.	15th Mar. "	"	
16. Munchersha Bezonji Engineer ... ..	"	28 "	" 1897-1898.	23rd " "	"	
17. Pirozesha Cowasha Dastoor ... ..	"	12 "	Mar. 1898.	25th " "	"	
18. Tehmina Cowasha Dastoor ... ..	Female.	8 "	" "	25th " "	Died.	Sister to the above.
19. Gulbai Pestonji Dhondi ... ..	"	27 "	Jan. "	28th " "	Cured.	
20. Jamsetji Pallonji Koodianawala ...	Male.	15 "	1897.	29th " "	Died.	
21. Kaikhusroo Hormusji Gotla ... ..	"	16 "	Feb. 1897.	9th April "	"	Death within 24 hours.
22. Dinbai Bezonji Modi.	Female.	17 "	Dec. 1898.	22nd " "	Cured.	
23. Sunabai Hormusji Dalal ... ..	"	25 "	" "	3rd May "	"	
24. Hormusji Jamsetji Vesooni ... ..	Male.	12 "	" "	9th " "	"	



On analysing the above table, it will be found that there are really only 4 cases (*viz.*, Nos. 15, 22, 23 and 24) that can be commented on. The others were inoculated more than 6 months prior to the attack, in fact the majority were inoculated from 11 months to 2 years prior to attack. Of those who were attacked and who may be noticed, No. 15 was inoculated one month prior to attack, and recovered; No. 22 was inoculated 5 months prior to attack and recovered; No. 23 and No. 24 about 6 months prior to attack and both recovered. No. 9 is a doubtful case, as the remark that he was inoculated "twice in 1898" is indefinite; however, even this case recovered.

So that out of 4 cases all recovered.

### Mahomedbhoy Ebrahim Khoja Plague Hospital.

No.	Names.	Age.	Sex.	Date of Inoculation	Date of Attack.	Date of Admissions.	Date of Death.	Date of Discharge.	Remarks.
		Years.							
1	Nanjil Teja .. ..	19	Male.		1-8-98	4-8-98	5-8-98	....	
2	Mahomed Warlu .. ..	35	"	Four times—twice in 1897, twice in 1898.	10-8-98	10-8-98	12-8-98	....	
3	Husain Noormahomed ..	18	"	Twice .. ..	11-8-98	13-8-98	15-8-98	....	
4	Noorbal, widow of Jeena Damjee .. ..	42	Female.	Once in 1898 ..	13-8-98	18-8-98	....	4-9-98	
5	Mojoo Jamal Mowjee ..	18	Male.	{ 30-3-98. } { 7-4-98 }	24-8-98	25-8-98	....	12-9-98	
6	Alibhoy Virjee Khimjee	10	"	Once in 1898 ..	7-9-98	10-9-98	....	24-9-98	
7	Footbal, widow of Canjee Jewraj .. ..	35	"	Twice .. ..	8-9-98	10-9-98	....	1-10-98	
8	Noormahomed Shariff Barmal .. ..	19	"	{ 7-9-97 } { 18-3-98 }	16-9-98	18-9-98	....	8-10-98	
9	Vally Mabomed Carim ..	14	"	Once, either January or February 1898 .. ..	25-9-98	27-9-98	28-9-98	....	
10	Mongu, wife of Noormahmed Virjee .. ..	13	Female.	Once .. ..	28-9-98	30-9-98	....	28-10-98	
11	Dhunjeebhoy Faljee Visram	36	Male.	Twice .. ..	28-9-98	1-10-98	....	4-11-98	
12	Esmail Jaffer Nathoo ..	37	"	Once in December 1897 .. ..	19-10-98	21-10-98	21-10-98	....	
13	Hoorbal, wife of Rowjee Janmahomed .. ..	30	Female.	9-1-98 .. ..	1-11-98	3-11-98	....	15-11-98	
14	Alimahomed Mahomed Poonja .. ..	12	Male.	Twice .. ..	10-12-98	13-12-98	....	12-1-99	
15	Bhanjee Alibhoy Carim	14	"	Once in 1897 ..	30-12-98	1-1-99	3-1-99	....	
16	Panbal, wife of Muradaly Gulam Hoson .. ..	28	Female.	Once in 1897 ..	31-12-98	7-1-99	....	12-1-99	
17	Sherbanoo, daughter of Ebram Virjee .. ..	13	"	{ 30-12-97 } { 10-1-98 }	16-1-99	19-1-99	....	19-2-99	
18	Fatmabal, wife of Ebram Virjee .. ..	33	"	Three times ..	18-1-99	20-1-99	....	3-2-99	
19	Mariam, daughter of Thava Jewraj .. ..	6	"	Twice. Last date 28-2-98; second in 99 .. ..	29-1-99	31-1-99	....	6-3-99	
20	Carmally Soomar Gulam Hoson .. ..	18	Male.	Once in 1898 ..	29-1-99	1-2-99	....	5-3-99	
21	Jaffer Bhanjee Poonja ..	47	"	Twice in 1898 ..	7-2-99	9-2-99	11-2-99	....	
22	Jainabal, daughter of Ebram Mahomed .. ..	8	Female.	Twice in 1898 ..	8-2-99	11-2-99	13-2-99	....	
23	Mahomed Dawood Datto	25	Male.	Once in 1898 ..	7-2-99	11-2-99	12-2-99	....	
24	Ahmed Ladha Poonja ..	20	"	Once in 1898 ..	9-2-99	12-2-99	....	6-3-99	
25	Nanbal, widow of Jamal Warlu .. ..	55	Female.	Twice in 1898 ..	10-2-99	14-2-99	....	6-3-99	
26	Avalbal, wife of Runtoola Kessum .. ..	20	"	Once in 1898 ..	13-2-99	15-2-99	16-2-99	....	
27	Nanjee Ramji Lakha ..	35	Male.	Once in 1898 ..	18-2-99	20-2-99	23-2-99	....	
28	Gulam Hoson Walji Harji	8	"	Once in 1898 ..	21-2-99	25-2-99	....	12-3-99	
29	Sakina, wife of Muradally Joorna .. ..	20	Female.	Once in 1898 ..	2-3-99	4-3-99	....	19-3-99	
30	Goolam Hoson Mahomed Dewjee .. ..	6	Male.	Twice in 1898 ..	4-3-99	8-3-99	....	22-3-99	
31	Veerbal, widow of Ebram Sewji .. ..	28	Female.	Twice about 6 months ago ..	7-3-99	9-3-99	12-3-99	....	
32	Jainabal, daughter of Mahomed Virjee .. ..	9	"	Three times in 1898.	6-3-99	9-3-99	....	9-4-99	
33	Sarabal, daughter of Mahomed Ramtoola .. ..	10	"	Once in 1898 ..	6-3-99	9-3-99	11-3-99	....	
34	Ramjee Teja Dhunjee	33	Male.	Twice—once in 1898, and 4 March 1899 ..	4-3-99	11-3-99	....	4-4-99	
35	Rimaltal, widow of Merall Bhimjee .. ..	35	Female.	Twice in 1898 ..	12-3-99	15-3-99	16-3-99	....	
36	Nazarally Hassum Poonja ..	12	Male.	Once in Feb. 1899 ..	18-3-99	20-3-99	....	4-4-99	
37	Bachoo Jamal .. ..	16	"	Twice in 1898 ..	18-3-99	20-3-99	25-2-99	....	
38	Jethbal, daughter of Pardan Ladha .. ..	10	Female.	Twice in 1898 ..	19-3-99	21-3-99	....	4-4-99	
39	Peerbal, daughter of Gulam Hoson Dossa .. ..	6	"	Once in 1898 ..	22-3-99	25-3-99	29-3-99	....	
40	Cachra Shariff .. ..	42	Male.	Once in 1898 ..	25-3-99	28-3-99	3-4-99	....	
41	Jainabal, daughter of Meberally Lalji	7	Female.	Once in 1898 ..	27-3-99	29-3-99	30-3-99	....	
42	Fatra, daughter of Datto Vally .. ..	9	"	Three times in 1898.	29-3-99	1-4-99	....	27-4-99	
43	Dossan Nathoo .. ..	46	Male.	12-3-98 and 3-98 ..	2-4-99	4-4-99	....	14-5-99	
44	Visram Khatow .. ..	55	"	Twice in 1898 ..	3-5-99	6-5-99	7-5-99	....	

On analysing the above cases, it will be found that in the largest proportion of cases mentioned, no definite conclusions can be arrived at owing to imperfect information regarding dates of inoculation; or being attacked over 6 months after inoculation. The only cases which can be commented on are the following :—

No. 5. Twice inoculated in 1898, the last time being on the 7th April; the attack was on the 24th August or little over 4 months after inoculations. The case recovered.

No. 8 was twice inoculated, the last time being in March 1898; the case was attacked on the 16th September or 6 months after inoculation. The case recovered.

No. 19 is interesting as being twice inoculated, the second time being within a very short period of attack. The patient recovered.

No. 31. A double inoculation; the patient was attacked by plague about 5 months after and died.

No. 36. Inoculated in February 1899 and was attacked by plague a month or so after and recovered.

These are the cases that can be reliably commented on, and it will be seen that only one case died 5 months after inoculation.

In taking all the cases of inoculations and attacks quoted above, it will be seen that in the Arthur Road, Modikhana and Prabhu, only 3 cases can be considered, *viz.*, 2, 4, and 7; of these 2 died, 1 recovered. In the Sarvajani Hospital only 1 case, No. 3, is of any use, and he died. The following table gives totals—

Arthur Road, Modikhana, Maratha,	Cases.	Died.	Recovered.
Prabhu, and Lund's Hospital ...	3	2	1
Sarvajani Hospital ... ..	1	1	...
Parsee Hospital ... ..	4	...	4
Mahomedbhoy Rajah Hospital ...	5	1	4
	<hr/> 13	<hr/> 4	<hr/> 9

I think, however, that there are too few cases to give any definite results.

In conclusion I may confidently say that the work of the hospitals was in most instances thoroughly and conscientiously carried on notwithstanding many adverse circumstances; and the medical officers, nurses, and subordinates have performed their duties very satisfactorily. I wish to bring to particular notice in connection with the Municipal Hospitals the excellent work done by Khan Bahadur N. H. Choksy, Medical Officer, Arthur Road Hospital; Dr. Dargalkar, Medical Officer, Marhatta Hospital; Dr. Turkhad, Modikhana Hospital; and of Hakim T. Rahiman of the Mahomedan General Hospital.

Of the private hospital I would like to bring to notice the names of Dr. Permanand of the Port Trust Hospital ; Dr. Kwaja Abdoola of the Kojah Hospital ; Dr. M. N. Disana of the Mahomedan Hospital ; also of the Hon'ble Dr. Balchandra Krishna who is so prominently connected with the various movements for the bettering of the Hindoo community, and through whose influence, combined with the energy and foresight of Rao Bahadur Tribuck Vaidya, some of the Hindoo hospitals are in the excellent condition they are at present.

My warmest thanks are due to Captain Howell, R. A. M. C., for compiling the figures, and in fact working up this report, while I was on leave ; and to Lt. Twigg, I. M. S., for the energy and care which he showed in working out the Steam Bath Treatment.

As regards the Nursing Establishment sent out for special plague work in Bombay, I cannot speak too highly of the devotion and courage displayed by these ladies in the performance of their very unpleasant work. In a foreign land and amongst the natives they displayed the same care and attention as they would have in their own wards in England. Those who have visited the wards of hospitals when these ladies were employed would be at once struck by the air of tidiness and cleanliness which pervaded the place. Their great effort night and day was to try every means in their power to save the lives of their charges, and if the reward of their efforts was in proportion to the energy they displayed in trying to save life, our mortality ought to be very low indeed. It was then under these depressing circumstances that these ladies worked, and I think the warmest thanks of all ought to be theirs ungrudgingly. The following is a list of nurses who worked at this epidemic :—

Lady Superintendent Miss L. Green.

Lady Nurse	„	Reynolds.
„	„	Coleman.
„	„	Tanner.
„	„	Harris.
„	„	Harvey.
„	„	Holmes.
„	„	Hale.
„	„	Barrow.
„	„	Richardson.
„	„	Greening.
„	„	Burrows.
„	„	Boyd.
„	„	Riley.
„	„	Fry.
„	„	Scott.
„	„	Snowdon.
„	„	Hyland.

Amongst the nurses locally engaged I must mention the name of Miss Winscom, who has worked at the plague hospitals at Bombay through all three epidemics, and is a devote worker amongst the poor.



**All Hospitals.** The following remarks are made by Capt. Howell, R. A. M. C., regarding the mortality and virulence of succeeding epidemics.

**Percentage  
Mortality  
1898-99.**

During the year under report, 10,210 cases of plague were admitted to hospitals. Of these 7,519 died. The percentage mortality of cases in hospital for the year therefore amounts to 73·6.

**Percentage  
Mortality  
March-June  
1897.**

On reference to General Gatacre's report it will be found that, during the four months in 1897 covered by his report, there were 2,646 cases of plague admitted to hospitals with a mortality of 1,561. This gives a percentage mortality of 58·9.

**Percentage  
Mortality July  
1897 to April  
1898.**

In the following ten months (1897-98) during which the Plague Committee had charge of the plague operations, we find 8,114 cases of plague admitted to hospital, and of these 5,336 died. This gives a percentage mortality of 65·7.

**Remarks on  
above.**

It will be inferred from a comparison of the above figures that each recurring epidemic of plague is more virulent than the last. This is an opinion very largely held by medical men in Bombay. It is doubtful, however, if the true increase in percentage mortality is so great as these figures would lead us to infer. For instance, General Gatacre's report does not cover the whole of the epidemic of 1896-97, but only deals with four months during which it was declining ; so that the 58·9 per cent. mortality shown by his figures would probably have been much higher if a longer period had been reported on.

The figures, however, do show a larger number of cases admitted to hospital during 1898-99 than in the previous epidemics. This will be readily seen if we compare the average monthly admissions to hospital. During General Gatacre's time the average monthly admission rate was 661·5 ; during the existence of the Plague Committee, 811·4, and during the year under report 850·8.

It may also be gathered from a comparison of the percentage rates of mortality that medical service is as helpless as ever as far as the treatment of plague is concerned.

(It should be noted that the above figures are based upon the returns submitted by hospitals, and a few of the smaller hospitals made no returns. The general accuracy of the figures given may however be accepted as substantially correct.)

J. S. WILKINS, Lt. Col., I.M.S.,

*Special Medical Officer, Plague Operations, Bombay.*

**No. 1.****ARTHUR ROAD HOSPITAL.**

1. Report on the Municipal Hospital for Infectious Diseases, Arthur Road, from the 1st June 1898 to 31st May 1899.

2. The hospital is a permanent institution and has been always open since plague commenced in 1896.

*Staff.*

Chief Medical Officer ... ..	1	Cooks ... ..	4
Assistant Medical Officer ... ..	1	Dhobees... ..	3
Hospital Assistants ... ..	4	Malee ... ..	1
English Nurses... ..	10	Bhistee ... ..	1
Local Nurses ... ..	6	Ambulance Men ... ..	8
Clerk ... ..	1	Lime-Washers ... ..	4
Compounder ... ..	1	Police Ramoosees ... ..	4
Telephone Clerk ... ..	1	Dispensary Servant ... ..	1
Ward Boys ... ..	46	Sweepers (Male) ... ..	16
Ayahs ... ..	10	„ (Female) ... ..	10

The above establishment was the maximum entertained during the height of the epidemic of 1898-99, and has varied at different periods according to requirements.

3. The disposition and arrangements of the wards, their use, etc., has been fully described in previous reports. No new wards were erected during the period.

4. Conservancy, etc., has been fully described in previous reports.

5. Water-supply has been fully described in previous reports.

6. Wards, etc., are washed twice daily with phenyle or cresol solutions. No clothing is sent to the steam disinfecter.

7. Disposal of the dead :—

(a). If friends or relations exist the bodies are removed by them for disposal to their respective places of burial, etc.

(b). Pauper patients who died were disposed of at public expense; the Hindu's corpses are sent to the Haine's Road cemetery, the Mahomadan to the Marine Road, and the Christian either to Sewree or Matoonga, according to their denomination.

(c). The mortuary is a *pucca* building with stone plinth, perforated zinc and corrugated iron walling, ridge corrugated iron roof, size 24' x 20'.

8. Only one case that had previously been inoculated with Professor Haffkine's prophylactic was admitted. The inoculation was made about 12 months previous to the attack; the patient died; he was a domestic servant, a Surtee boy, aged about 15, in the service of Mr. W. Latimer.

9. Hospital Assistant Pandharinath was attacked with plague in November 1898; he recovered; he lived on the premises. The source of contagion was from hospital work. No other member of the hospital staff was attacked with plague.

10. Relapsing Fever was contracted by 10 ward boys and 12 sweepers, all the former recovered, and of the latter two died; they all lived in on the premises and were working in the Relapsing Fever wards. The source of contagion was from hospital work.

TABLE I.—*Total admissions during the Year.*

Months.				Plague.	Relapsing Fever.	Cholera.	Small-pox.	Chicken-pox.	Measles.	Whooping Cough.	Observation and other Diseases.
June	1898	...	...	12	116	...	1	...	...	...	23
July...	"	...	...	28	114	4	...	1	...	...	34
August	"	...	...	73	132	...	5	1	...	...	34
September	"	...	...	91	214	...	...	...	...	...	18
October	"	...	...	63	191	...	...	1	...	...	22
November	"	...	...	22	90	...	...	1	...	1	7
December	"	...	...	73	99	...	3	2	1	...	6
January	1899	...	...	178	91	...	2	1	1	...	15
February	"	...	...	324	112	...	9	2	20	...	19
March	"	...	...	390	135	...	9	3	13	...	15
April	"	...	...	164	81	...	26	...	5	...	10
May	"	...	...	52	61	...	18	...	...	...	13
Total				1,470	1,436	4	73	12	40	1	216

Grand Total—3,252

Plague ... .. 1,470

Relapsing Fever ... .. 1,436

Observation and other diseases ... 346

3,252

11. The largest number of admissions was during the week ending 11th March 1899, when 113 plague patients were admitted.

The largest number of plague admissions on any day was on the 10th March 1899, on which day 25 plague patients were admitted.

12. Total number of deaths during the year, 1,508.

Total number of deaths from plague, 1,161.

Total weekly deaths, 97 in week ending 11th May.

Percentage of deaths to admissions during the week, 56·72 per cent.

The largest number of deaths from plague was 18 on the 10th of March 1899.

TABLE II.

							Admissions	Deaths.	Recoveries.	Percent- age of Mortality.
Plague	...	...	...	...	...	...	1,470	1,161	309	78·97
Relapsing Fever	...	...	...	...	...	...	1,436	311	1,125	21·65
Cholera	...	...	...	...	...	...	4	2	2	50·00
Small-pox	...	...	...	...	...	...	73	6	6	8·49
Chicken-pox	...	...	...	...	...	...	12	.....	12	00·00
Measles	...	...	...	...	...	...	40	3	37	7·50
Whooping Cough...	...	...	...	...	...	...	1	.....	1	00·00
Observation and other Diseases	...	...	...	...	...	...	216	26	191	11·57
Total							3,252	1,509	1,743	46·37



TABLE III (A).—*Plague.*

Months.				Total Admissions	Died within 24 hours.	Died within 48 hours.	Total Deaths.	Total Recoveries.	Per cent- age of Deaths.
June	1898	...	...	12	2	1	4	8	33·33
July	"	...	...	28	5	5	22	6	78·57
August	"	...	...	73	27	15	56	17	76·71
September	"	...	...	91	27	17	75	16	82·41
October	"	...	...	63	25	9	53	10	84·12
November	"	...	...	22	6	2	18	4	81·81
December	"	...	...	73	25	8	55	18	75·34
January	1899	...	...	178	73	42	149	29	83·77
February	"	...	...	324	109	56	257	67	79·32
March	"	...	...	390	114	79	310	80	79·48
April	"	...	...	164	48	36	128	36	78·04
May	"	...	...	52	20	11	34	18	65·38
Total				1,470	481	281	1,161	309	78·97

TABLE III (B).—*Relapsing Fever.*

Months.				Total Admissions.	Total Deaths.	Total Recoveries.	Percentage of Mortality.
June	1898	...	...	116	21	95	18·10
July	"	...	...	114	20	94	17·54
August	"	...	...	132	19	113	14·39
September	"	...	...	214	46	168	21·49
October	"	...	...	191	37	154	19·37
November	"	...	...	90	30	60	33·33
December	"	...	...	99	21	78	21·21
January	1899	...	...	91	18	73	19·78
February	"	...	...	112	16	96	14·28
March	"	...	...	135	40	95	29·62
April	"	...	...	81	29	60	25·92
May	"	...	...	61	22	39	36·06
Total				1,436	311	1,125	21·65

TABLE IV (A).—*Plague.*

—	No.	Died.	Recovered.	Percentage of Mortality.
Hindoos ... ..	1,307	1,049	258	80·26
Mahomedans... ..	73	49	24	67·26
Native Christians ... ..	90	63	27	70·00
Total ...	1,470	1,161	309	78·97

*I—Hindus.*

—	No.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	908	740	168	81·49
Females ... ..	267	210	57	78·65
Children ... ..	132	99	33	75·00
Total ...	1,307	1,049	258	80·26

*II—Mahomedans.*

—	No.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	62	42	20	67·74
Females ... ..	7	5	2	71·42
Children ... ..	4	2	2	50·00
Total ...	73	49	24	67·26

*III—Native Christians.*

—	No.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	63	46	17	73·01
Females ... ..	23	15	8	65·21
Children ... ..	4	2	2	50·00
Total ...	90	63	27	70·00

TABLE IV (B).—*Relapsing Fever.*

—	No.	Died.	Recovered.	Percentage of Mortality.
Hindus ... ..	1,376	295	1,081	21·43
Mahomedans ... ..	40	9	31	22·50
Native Christians ... ..	19	7	12	36·84
Israel ... ..	1	.....	1	00·00
Total ...	1,436	311	1,125	21·65

*I—Hindus.*

—	No.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	1,040	240	800	23·07
Females ... ..	203	50	153	24·63
Children ... ..	133	5	128	3·75
Total ...	1,376	295	1,081	21·43

*II—Mahomedans.*

—	No.	Died.	Recovered.	Percentage of Mortality.
Males... ..	38	9	29	23·68
Females ... ..	2	.....	2	00·00
Children ... ..	.....	.....	.....	.....
Total ...	40	9	31	22·50

*III—Native Christians.*

—	No.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	14	5	9	35·76
Females ... ..	4	2	2	50·00
Children ... ..	1	.....	1	00·00
Total ...	19	7	12	36·84

*IV—Israel.*

—	No.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	1	.....	1	00·00
Females ... ..	.....	.....	.....	.....
Children ... ..	.....	.....	.....	.....
Total ...	1	.....	1	.....



TABLE V.—*Mortality in Sexes and Children.*(A)—*Plague.*

Mortality for the Year.	Mortality amongst Men.	Mortality amongst Women.	Mortality amongst Children.
1,161= 78·97	828= 80·15	203= 77·44	103= 73·57

(B)—*Relapsing Fever.*

Mortality for the Year.	Mortality amongst Men.	Mortality amongst Women.	Mortality amongst Children.
311= 23·65	254= 23·23	52= 24·88	5= 3·73

TABLE VI.—*Showing the Situation of Buboes.*

Situation.	No.	Males.	Females.	Children.	Mortality.	Re-covered.	Percentage of Mortality.
Cervical ... ..	69	50	7	12	51	18	73·91
Parotid ... ..	21	11	6	4	14	7	66·66
Right Axillary ... ..	137	91	27	19	113	24	82·48
Left Axillary ... ..	123	86	25	12	92	31	74·79
Right Femoral... ..	128	98	23	7	95	33	74·21
Left Femoral ... ..	160	126	21	13	132	28	82·50
Right Inguinal ... ..	108	82	19	7	76	32	70·37
Left Inguinal ... ..	101	85	14	2	88	13	87·12
Other Situations* ... ..	19	10	5	4	15	4	78·94
No Buboes ... ..	158	119	31	8	135	23	85·44
Multiple Buboes ... ..	390	230	130	30	296	94	75·89

\* Supra Trochlear, Occipital, Brachial, Popliteal, Pectoral, Iliac, &c.

TABLE VII.—*Pneumonic Plague.*

	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	50	48	2	96·00
Females ... ..	5	5	.....	100·00
Children... ..	1	1	.....	100·00
Total ... ..	56	54	2	96·42

TABLE VIII.—*Secondary Plague Pneumonic.*

	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	63	55	8	87·30
Females ... ..	22	20	2	90·90
Children... ..	15	12	3	80·00
Total ... ..	100	87	13	87·00

Pneumonia generally supervened on the third or fourth day.

*Symptoms, Character and Treatment.*—These have been fully described in previous report. No essential changes have been made in the line of treatment, which has hitherto been mainly stimulant to the entire exclusion of all antipyretics, depressants, or internal antiseptics.

*Period of Incubation.*—The period of incubation extends from three to ten days. In some cases that take a very mild course—*pestis ambulans*—the period is somewhat prolonged, and may extend to even fifteen days. It is not possible to say whether this is due to the greater resistance of the system or to a small or less virulent dose of the poison.

*Fever.*—All the points under this heading have been fully described in previous reports.

The inquiries under the remaining clinical heads have been also similarly described.

*Plague complicated with other Diseases.*—Plague associated with the following has been observed :—

- (a) Small-pox.
- (b) Chicken-pox.
- (c) Measles.
- (d) Malaria.
- (e) Relapsing Fever.
- (f) Phthisis.

The last complication is extremely fatal. Malaria and relapsing fever exert a modifying influence on the course of plague, making it milder.

Mumps have never been mistaken for plague, for the gravity in the two diseases is so different.

*Observation Cases.*—These numbered 216 cases, and comprised malaria, rheumatism, diarrhoea, dysentery, syphilis, guinea-worm, heart disease, kidney diseases, &c., &c.

*Lustig's Serum.*—Full reports on the treatment with Lustig's serum have been supplied from month to month.

N. H. CHOKSEY,

BOMBAY,  
28th July 1899.

Medical Officer, in Charge, Arthur Road Hospital.

*Note by the Special Medical Officer.*—Dr. Choksey's work since the beginning of the plague epidemic in Bombay is well known, and requires no further praise from me. The Hospital was conducted, and the sick treated, with every care, kindness and skill.

The report on the inoculation by Lustig's serum as manufactured by Professor Gallioti at Parel is published in full, with remarks in the Appendix.

## No. 2.

### Report on the Modikhana Plague Hospital, Bombay, from the 1st June 1898 to 31st May 1899.

#### History.

1. The Hospital was first opened, on the 8th January 1898, by the Plague Committee, under the Chairmanship of Sir James Campbell, K.C.I.E., and has been since in charge of the following Medical Officers in succession :—

Surgn. Julius, R. N.  
Surgn. Bernard, R. N.  
Surgn. Page, R. N.

The present Medical Officer took charge of the Hospital on 28th July 1898.

The Hospital was then chiefly used for detaining and keeping under observation cases of fever sent from the various bunders by the Port Health authorities. The numbers of plague admissions were then comparatively few, but they gradually swelled with the increase of plague in the City.

In February 1899, the Health Officer of the Port opened a special camp for his "Bunder cases" on the site of the old Modikhana Camp, and ceased sending them to this Hospital. This helped much to increase our accommodation for plague cases.

In March 1899, accommodation was further augmented by opening two extra wards.

The largest number of patients under treatment in this Hospital was 135 on the 12th March 1899.

#### Staff.

During the height of the epidemic, the following staff was employed :—

1 Medical Officer.	4 Ayahs.
4 Lady Nurses.	2 Cooks.
2 Local Trained Nurses.	3 Dhobies.
2 Hospital Assistants.	1 Limewasher Muccadum.
1 Clerk.	9 Coolies.
1 Compounder.	4 Ramosis.
1 Muccadum of Ward boys.	11 Mehtars.
13 Ward boys.	4 Mehtranis

In addition to this, the following staff was employed for the Modikhana Steam Sterilizer worked in connection with this Hospital :—

- 1 Engineer.
- 1 Fireman.
- 4 Coolies.

During the period under report, the following Lady Nurses worked in this Hospital :—Miss Green, Miss Truman, Miss Harris, Miss Fry, Miss Scott, Miss Riley, and Miss Hale. To these ladies, to the Hospital Assistants, and to the staff in general, the Medical Officer offers his best thanks for their cheerful co-operation and valuable assistance rendered during the time.

#### Hospital.

2. The Hospital consists of following sheds :—

7 Wards.	1 Mortuary.
1 Office.	1 Store-room for lime.
1 Dispensary.	2 Sheds for Servants' quarters.
1 Resident Hospital Assistant's quarters with kitchen.	1 Shed for Mehtars.
1 Hospital kitchen.	1 Contact shed and kitchen.
1 Godown for food, stores, &c.	1 Shed latrines.

In addition to these, there are four other godowns, one shed for Dhobies' *bhuthee* and a sentry box.

#### Sisters' quarters.

In January 1899, quarters for Nurses were put up adjoining the Hospital compound, with accommodation for three Sisters, their servants, and a kitchen. During the height of the epidemic the extra Sister was provided with a tent pitched close by.



**Wards.**

The wards are constructed of teak and bamboo supports, the sides of double bamboo matting and roof of cudjan or jowli, and rendered waterproof with tarpaulins. Two of the wards have canvas ceilings. All the wards are ventilated from below by means of one-foot frame, made to be opened up or let down as required. There is also about a foot of open space in each ward between the roof and the sides. The floor is raised so as to form a plinth of about 8 inches in height, and is made of a mixture of earth and fine charcoal dust well beaten down.

Every shed is, at intervals, limewashed both inside and out.

All the cooking places, as well as the Dhobies' *bhuthee* shed, are made completely of corrugated iron, to prevent the risk of fire.

Four of the wards are provided each with a bath-room with concrete floor and a stand-pipe. This arrangement is found to be more convenient and satisfactory than having stand-pipes outside in the compound. These four wards have been reserved as follows :—

- 1 Acute Male Plague Ward.
- 1 Female Ward.
- 1 Male Observation Ward.
- 1 Male Convalescent Ward.

The remaining three wards were only used during the height of the epidemic for the accommodation of the increased number of male and female convalescents.

**Dispensary.**

The dispensary is provided with a stand-pipe, and furnished with medicines likely to be useful in a plague hospital.

**Servants' quarters.**

Servants' quarters consist of two long sheds, and provided with chullas outside; no servants being allowed to cook inside their rooms.

**Contact shed.**

There is a large contact shed with rooms, with accommodation for about 50 contacts; it has its own washing place with a stand pipe and a kitchen exclusively for the use of the contacts.

**Dhobies' washing place.**

There is a tank and a washing place built, and reserved exclusively for the use of the hospital dhobies; and also an arrangement for their *bhuthee* or oven. All the hospital clothing is washed on the premises.

**Conservancy Surplus Water.**

4. *Conservancy*—All the surplus water from the various stand-pipes of the wards, kitchens and cooking-places is carried away into the sea by means of open drains constructed of 4" stone-ware half pipes laid on a foundation of concrete.

**Ward Conservancy.**

The contents of bed-pans are emptied into pails containing a solution of phenyle and provided with lids. These pails are regularly emptied into a night-soil cart specially provided for the use of the hospital, and which makes daily two trips to the nearest depôt to discharge its contents.

**Latrines and disposal of sewage.**

The Latrine is six-seated; two seats being reserved for females and four for males. The night soil is received into iron receptacles, from which the solid portion is removed to the conservancy cart, twice daily in cold season, and three times in the hot weather. Until March 1899, the liquid portion of the night-soil was allowed to run into a cesspool which was emptied every morning. This plan, however, was found to be much objectionable. The cesspool was consequently done away with, and the liquid sewage is now made to run directly into the main drain.

**Water supply.**

5 *Water-Supply* is derived from Tansa and Tulsi Lakes.

**Disinfection  
of Wards.**

6. *Disinfection*.—Regularly three times in 24 hours, the floor of each ward is sprinkled over with phenyle and swept by the ward mehtars, and every morning powdered lime is spread over the floor through fine sieves. The walls and floors of the wards and outhouses are lime-washed as often as necessary, quick lime being used for the purpose.

**Of dejecta.**

Discharges from patients soiling the floors are disinfected with phenyle, swept up, removed, and the spot lime-washed.

**Of dressings.**

The dressings are all burnt in the incinerator.

**Of soiled  
clothing.**

All soiled clothing is carried from the ward, and put directly into a large tub containing a solution of phenyle. Twice daily it is taken out of the disinfecting solution and washed by the mehtars. It is then sent to the disinfector for final sterilization.

**Modikhana  
Sterilizer.**

This hospital has the advantage of the close proximity of the Modikhana sterilizer. Every morning all the changed or soiled clothes from the wards, such as jackets, sheets, blankets, kumbliies, &c., are sent to the disinfector for sterilization. It is an "Equifex" steam disinfector stove of Geniste Herscher patent, and consists of a vertical boiler of 8 h. p. and a sterilizing chamber. The latter is made of steel, covered over on the outside with wooden planking, and having along its internal surface a coil of tubes. The sterilizing chamber is provided with doors for opening from either end, and inside it is a wire cradle for holding the articles to be sterilized, and arranged to move out and in on rails at both ends.

All the clothing to be disinfected, is put into this cradle, special care being taken in the case of mattresses, &c., to have space between them by means of pillows or other suitable articles so as to allow the steam to penetrate into every corner. The doors are then securely fastened.

**Mode  
of working.**

The steam generated in the boiler is then introduced into the chamber, the air contained in it being allowed to escape. When the thermometer indicates a temperature of 180°, the air valve is shut off, and the pressure of the steam in the chamber is allowed to rise until the gauge indicates a pressure of 10 lbs. After the end of five minutes, the compressed steam is let off. This causes a partial vacuum in the chamber, so that when the fresh supply of steam is introduced, it is able to penetrate into the articles more thoroughly.

This process is repeated three times. The steam is then finally allowed to escape. If the articles are removed at this stage, they will be found to be thoroughly sterilized, but will be very wet owing to a certain amount of condensation of steam into water.

To dry the articles, steam is let into the coil of tubes along the inner aspect of the sides of the chamber, the water in which is, in consequence, evaporated to dryness in about 10 minutes. The articles will then be found to be thoroughly dry.

The whole operation of sterilization takes about half an hour.

The clothing, after it has been thus sterilized, is handed over to the hospital dhobies for washing.

**Mortuary.**

7. The *Mortuary* is not a pucca structure, but only a shed 20'×10' of matting and jowlies with perforated tin sheeting running along the lower portion of the sides, and serving the double purpose of ventilation as well as protection of corpses from the attacks of rats. It is also ventilated from above by an open space between the sides and the roof. The floor is kutcha.



**Removal of the dead.**

After the death of a patient, the body is immediately removed to the mortuary by the wardboys, the patient's name written on a piece of paper, being tied to the wrist for subsequent identification before the body is removed from the ward. No corpse is allowed to remain for more than 12 hours, at the end of which period it is considered as unclaimed and disposed of accordingly.

**Disposal of unclaimed bodies of Hindoos.**

In the case of unclaimed Hindoos of all castes, a telephone message is sent to Health Department Stables at Paltan Road, and a cart specially kept for the purpose of removing dead bodies is requisitioned for. Unclaimed Hindoo corpses are removed therein to the Haines Road Cemetery.

**Unclaimed Mahomedans.**

For the removal of an unclaimed Mahomedan pauper, arrangements have been made with the Sonapore authorities who, upon receiving information, send three Mahomedan corpse-bearers with a bier to remove the body. These men are paid at the rate of Rs. 3 for each body.

**Unclaimed Protestants.**

In the case of unclaimed Protestants, information is sent to the Superintendent of Police, A Division, who arranges about the funeral through the Government Contractors.

**Unclaimed Roman Catholics.**

In the case of Roman Catholic paupers, the necessary pauper certificates are furnished by the priests of their respective jurisdictions.

**Haffkine's Cases.**

8. Two cases treated with Mr. Haffkine's prophylactic inoculations, were admitted into the Modikhana Hospital :—

The first case was Samuel John, (Reg. No. 1969), a Madras Christian, male, age 26 years, was inoculated on the 3rd of February 1899. On the 23rd February he was admitted into this hospital with fever and tenderness in right axilla, in a semi-unconscious and delirious condition, pulse weak. On admission, he was noticed to get epileptiform fits, every 15 minutes. At first twitchings used to commence in the left arm, and then spread over the whole body, ending in tonic spasms with sighing respirations and much foaming at the mouth. The man's relations stated that he never suffered from any fits before he was inoculated.

The fits continued the next day, when a swelling was noticed in the left parotid region, pulse weak, patient semi-conscious.

Under the influence of Bromide the fits ceased. On the 2nd March the tender axillary gland could not be detected, the parotid swelling was fluctuating. The man was decidedly worse. He died the next day.

No bacteriological examination was made.

The second case was Reg. No. 2347. Valentine Vaz, Christian, male, aged 17 years, was inoculated with Haffkine's prophylactic on the 15th February 1898. On the 16th of March 1899, he was admitted into this hospital, suffering from fever and a small tender bubo in the left groin. On admission he was conscious but depressed, tongue coated, pulse rapid but fairly strong. The bubo had made its appearance the same day. The next day the gland was very painful, the pulse weak and the evening temperature was 103°. On the 20th he was delirious. The next day his condition began to improve; the temperature never rose above 103°·6, the bubo softened and was incised on the 25th and a large amount of pus let out. He made an uninterrupted recovery and was discharged cured on the 24th April 1899.

**Mortality amongst Staff.**

9. As regards sickness and mortality amongst the staff, there is much satisfaction to note, that this has been exceptionally low, considering the liability of infection to which the hospital staff has been exposed. In October 1898 a hospital dhobie died of Pneumonic Plague, which there is reason to believe, he must have contracted during the discharge of his duties. This occurrence took place before the Modikhana sterilizer was re-opened for use.



In December 1898 an ambulance cooly died of plague in his own house. It is suspected that he must have caught the infection from outside, for none of the other coolies working with him were attacked, while there was much plague in the locality where he was living.

**Incubation period.**

As regards the incubation period of plague, no proper observations could be carried on, owing to conflicting statements made by patients and their relatives, and from the impossibility of ascertaining where the infection was caught.

**Chinaman's case.**

However, in connection with this, the following case, Reg. No. 2412, is very interesting :—

Kwok Nam, 30 years, male, a Chinese cook on board the S.S. "Bormida," was admitted into the Modikhana Hospital on the 21st March 1899, suffering from undoubted symptoms of plague. The history was that the steamer left Hongkong, which at that time was free from plague, and on the way touched Penang, also free from plague. For about 7 days before reaching Bombay, the patient was suffering from fever, and on the morning of 21st when the steamer arrived in the harbour, he became violently delirious. He was in consequence immediately removed to the Gokuldass Tejpal Hospital where he was refused admission, and whence he was sent direct to this hospital. On admission he had a typical phlyctenular ulcer below the umbilicus and a bubo in each groin. Pure cultures of plague were obtained by Lt. Liston, I.M.S., from the blood taken from the bubo from the left groin and also from blood taken from a puncture near the ulcer. Thus there was no question as regards the diagnosis ; for that was proved not only clinically but also bacteriologically. Where could he have therefore caught the infection ? If he got it in Hongkong, was it possible for it to take such a long time for incubation ?

CLINICAL DESCRIPTION.

**Clinical notes.**

The commencement of the illness in most cases was sudden, accompanied by a sensation of chilliness often going into rigors. In some cases there were preliminary symptoms present, such as malaise, headache, or a feverish state, but generally these were absent, patients being quite well until the sudden onset of chilliness. The temperature soon rose to 102° and upwards, the initial rise being rapid, and it continued to be high until about the 4th day when there was noticed a tendency for the fall of the temperature. This was marked in mild cases in which there was no subsequent rise in the temperature after this fall. There was no case of hyperpyrexia noticed, the highest temperature being 106°F.

**Onset.**

**Characteristic Symptoms.**

The fever was accompanied by the following characteristic symptoms, which, in the absence of bacteriological diagnosis, served as guides in arriving at the diagnosis of plague :—

1. Characteristic general appearance.
2. Certain nervous symptoms.
3. Want of tone in the pulse.
4. The presence of bubo in the bubonic cases.

**General appearance.**

1. Most of the patients had an anxious frightened look, sometimes apathetic, dull and heavy. They generally preferred lying on one side with legs drawn up, unless prostration was marked, when the decubitus became dorsal, face flushed, congested and swollen looking, the color of the skin of the eyelids, nostrils and lips dusky, conjunctiva injected, sometimes bloodshot, eyes watery.

The speech was noticed to be quite characteristic, words being uttered in a peculiar confused, hesitating, stammering manner, something like the speech of a drunken man.

**Nervous  
Phenomena.**

2. *Nervous Symptoms.*—Certain nervous symptoms were invariably present, generally showing themselves early during the illness. These symptoms were attributable to perversion of consciousness in different ways :—In some cases there was a partial loss, amounting to a state of lethargy or drowsiness from which the patients could be roused by being loudly spoken to. In other cases of a severe type the loss of consciousness was complete from the beginning, gradually passing into coma and death without the patient ever regaining consciousness.

In most of the cases, delirium was present, varying from slight incoherency to wild mania, being met with almost invariably at some period or other of this illness, generally coming on early. In some cases it was of a low muttering type, the patients lying still, from which state they could be roused to answer questions, however to gradually pass again into their delirious condition.

Generally the delirium was accompanied with restlessness, illusions and hallucinations, and in some cases it was of an extremely violent type, the patients shouting aloud, gesticulating wildly with staring eyes as in acute mania ; they jumped out of their beds, struggled violently with the ward attendants, and if not properly secured they would have run away and seriously injured themselves.

**Pulse.**

3. The Pulse as a rule was increased in frequency, varying from 100 to 180 per minute. In character it might be found to be full and strong in the beginning, but very soon it became small in volume and lost its tone, so that it could be easily obliterated. This softness of the pulse was found always to be a very characteristic sign.

**Bubo.**

4. All doubt about the diagnosis was removed by the presence of a bubo or buboes, proper care having been taken to ascertain that they were not of a venereal origin. A tabular statement showing the position of buboes has been given under the Table No. VI.

**Variety.**

A bubo generally made its appearance within 48 hours, accompanied by a sensation of pain in the region. In mild cases it consisted simply of an enlargement of a gland, very little painful or tender. In a great majority of cases however, there was a painful inflammatory swelling of a lymphatic gland with a good deal of œdema or infiltration of the surrounding areolar tissue. To the naked eye it appeared as a simple swelling of varying size ; the skin over it normal or faintly red, according to the degree of surrounding infiltration, which also determined its moveability. Such a bubo was extremely tender. In other cases it appeared as an inflammatory infiltration of cutaneous and sub-cutaneous tissue in which no enlarged gland could be detected. The affected part appeared swollen, the swelling diffused, bluish red or dusky in colour, angry looking, hard and brawny to the feel. Such buboes showed a rapid tendency to spread in every direction, and were consequently of a serious nature.

The course of the buboes will be dwelt upon under the progress of the disease.

In addition to these signs, various other disturbances were produced by the implication of the different systems in the body :—

**Cutaneous  
Symptoms.**

*Cutaneous System.*—The skin was noticed to be mostly hot and dry, but in a few cases clammy and moist, the perspiration having no particular odour.

The colour of the skin generally muddy, dusky, sometimes much cyanosed. No characteristic eruptions on the skin were noticed.



**Phlyctenules.** Pustules or phlyctenules were noticed in 10 cases, and had a distinctive appearance; in the beginning a small vesicle was noticed which showed umbilication and contained a clear fluid which afterwards became greyish and purulent. A zone of inflammation invariably surrounded the base which was hard and painful. The vesicle gradually enlarged, and if the patient survived, it sloughed away, leaving a deep punched out ulcer, very slow to heal.

**Alimentary Symptoms.** *Alimentary System.*—There was generally intense thirst, dryness of the tongue, sordes, and foul breath. The tongue coated brown or even black, dry, sometimes cracked, and sometimes the papillæ unusually prominent. But there was nothing characteristic about the appearances of the tongue in plague.

In cases of buboes in the cervical region accompanied with much surrounding infiltration there was dysphagia.

**Vomiting.** In some cases there was vomiting, sometimes incessant, so that patients were not able to retain anything. The vomited matter might be :—

1. Simple Mucous.
2. Medicines, &c., and curdled milk.
3. Bilious matter.
4. Coffee grounds.
5. Blood.

Sometimes the vomit was very offensive.

The abdomen was generally found to be distended, either from dilatation of the stomach, Intestinal flatus or from distension of the bladder.

On palpation it was sometimes tender all over. In the cases of deep-seated pelvic buboes, they could be easily felt upon deep pressure in the iliac regions.

Generally there was constipation, sometimes diarrhœa, occasionally fœted. In some cases there was melœna.

The presence of ascarides lumbricoides was almost a constant occurrence.

**Liver and Spleen.** The liver was sometimes found enlarged. The spleen was often found to extend beyond the costal arch.

**Circulatory Symptoms.** *The Circulatory System.*—The characteristic want of tone in the pulse has been previously described.

**Heart.** Heart's sounds were often noticed to be muffled. Dilatation of the heart was not detected.

**Hæmorrhages.** Various hæmorrhages were noticed; epistaxis, hæmorrhages into conjunctivæ, bleeding from the throat, hæmoptysis, hæmatemesis, and also melœna.

There were no cases of hæmaturia nor hæmorrhages into the skin.

**Respiratory Symptoms.** *Respiratory System.*—Hiccough was sometimes noticed. The respirations were hurried, generally above 30 per minute, and in grave cases with pulmonary complications, short, irregular and gasping. Congestion of the pulmonary tissue or of the bronchioles or a catarrhal condition of them was noticed in a majority of cases. This secondary pneumonic condition was noted in 19 cases out of 28 cases treated by the Indian Plague Commission with M. Roux's serum, an analysis of which will be given in the form of an appendix.

A description of primary pneumonic plague will be given subsequently.

**Nervous Symptoms.** *Nervous System.*—Besides the symptoms of drowsiness and delirium and the characteristic manner of speech, mentioned above, various other nervous phenomena were noticed. Delirium was rapidly followed by great prostration and coma.



Headache was more or less a constant symptom and so also sleeplessness.

In a few cases a peculiar fibrillar trembling of muscles was noticed.

Generally there was marked muscular atrophy, and sometimes spasmodic muscular contractions of extremities, sometimes spasms resembling tetanus.

Picking at bed clothes was noticed in severe cases, and in a few cases convulsions preceded death.

#### Urine.

*Urinary System.*—Unfortunately, owing to pressure of work, no special observations were made with regard to this system. Retention of urine was a common symptom, but suppression was never met with. There appeared to be no diminution as regards the quantity of urine excreted.

#### Complications.

The various *complications* met with have been described above under the various systems, and, in addition to these, acute conjunctivitis, ulcerative keratitis and hypopyon have been constantly noticed.

Aphasia was met with, and in one case the patient remained aphasic for nearly one month after the subsidence of all the acute symptoms.

Pregnancy complicated plague in six cases. Abortion followed in every case. There were no recoveries.

Secondary abscesses were met with in a large number of cases, and in one case eight such abscesses were opened.

In some cases the pus from suppurated buboes showed a tendency to travel along the areolar tissue in long directions.

#### Sequelæ.

The sequelæ of plague were noticed to be, firstly, a very protracted period of convalescence, the result of asthenia following the extreme prostration from the action of the toxins of plague on the tissues. The ulcerations resulting from the suppuration of buboes, or from sloughing away of dead tissue of buboes or plague phlyctenules, showed no tendency to rapid healing.

Two cases developed phthisis during convalescence and died of exhaustion.

Dementia was observed in one case.

#### Clinical Varieties.

For Clinical purposes three *varieties* of plague were recognised :—

- (1). Bubonic.
- (2). Septicæmia or non-bubonic
- (3). Pneumonic.

#### Bubonic Plague.

The bubonic variety was accompanied by the presence of bubo which confirms the diagnosis of the disease.

#### Non-bubonic Plague.

In the second variety all the typical symptoms of plague were present, but no bubo could be detected externally. This so called septicæmic or non-bubonic type was met with in 294 cases. The absence of buboes showed that the infection was not through the ordinary lymphatic channels. The term "Septicæmic" is misleading, for every case of plague is a septicæmia, and there is no reason, therefore why this term should be applied to non-bubonic cases in particular.

#### Pneumonic Plague.

The third clinical variety is *pneumonic plague*. In a certain number of cases all the usual symptoms of plague are present, but no bubo, showing that the infection is not through the lymphatic system. There are, however, on physical examination certain inflammatory lesions invariably found in the lungs; and the sputum is found by bacteriological examination to be swarming with plague. It is inferred from this that in these cases the primary infection is through the respiratory tract.

In these cases of primary pneumonic plague, the appearance of the patient was found to have quite characteristic symptoms. The expression was very anxious and frightened, face cyanosed, extreme restlessness, short, hurried and gasping respirations, cough short, but not troublesome, sputum scanty, frothy, either speckled with blood or bloody.

The physical examination, however, was not found to reveal signs of any magnitude to account for the severity of the symptoms. A careful examination detected, perhaps, a small patch of impaired resonance, which on auscultation showed a few rouchi and a few small crepitations. The presence of the numerous plague bacteria in the sputum made these pneumonic cases very infectious: they were, therefore, kept, according to Col. Wilkins' suggestion, together in a corner of the acute ward.

In some of these cases bacteriological examinations were made by Lieuts. Douglas and Walton, of the I.M.S., who found the sputa in pneumonic plague to be pure cultures of *B. Pestis*. Oedema of the anterior thoracic wall was not met with in a single case of primary pneumonic plague.

**Termination  
Favorable  
Symptoms.**

*Termination.*—The suppuration of the bubo was always found to augur favorable prognosis. Other favorable symptoms were the fall of temperature to normal, without any tendency for a subsequent rise; the disappearance of the nervous phenomena, clearing up of the fur on the tongue and the lessening of the snffusion of the conjunctiva.

**Unfavorable  
Symptoms.**

The prognosis should be, however, always guarded, for cases that looked favorable might suddenly develop prostration, and as the result of the slightest exertion a patient might suddenly drop down dead. The presence of complications was always looked upon as an unfavorable symptom; also convulsions, muscular witchings and delirium. The tendency for the bubo or the phlyctenule to spread was also looked upon as a bad omen, so also if the patient kept a high temperature and showed accelerated pulse and respiration rates.

**Treatment  
General  
remarks.**

On coming to the hospital every patient was immediately examined and sent to the appropriate ward. After admission into the ward he was undressed and thoroughly sponged over with soap and hot water, all his clothing sent to the sterilizer to be disinfected, and anything that was filthy was burnt in the incinerator.

Short clinical notes were then taken down by the Hospital Assistants. All the cases of pneumonic plague were kept together.

With the increase of the number of acute cases, the usual number of Ward boys and Mehtars had to be doubled in the acute plague ward and even this number was sometimes found to be inadequate.

All the dying and the delirious were screened off. To cause this to be carried out in a more effectual manner, the Special Medical Officer had the acute plague ward divided into 19 compartments, each about 7'  $\times$  6', by means of partitions of bamboo matting about 6 feet high; but they were found much to interfere with the work of the nurses and to reduce the ventilation of the ward. When the weather-frames were put up in the rainy season, they further interfered with the ventilation, and were consequently removed. The great drawback about this arrangement was that the compartments were too small, and it necessitated the employment of a larger staff of ward attendants. There can be certainly no doubt that the sight of so many patients raving and gesticulating like mad men, and then suddenly dropping down dead, is quite sufficient to give a most profound shock to a freshly admitted patient with unimpaired mental faculties—a shock that may certainly reduce his chances of recovery. I am of opinion that smaller and moveable screens will better serve this purpose.



All the ward attendants had special instructions that under no circumstances was an acute case to be allowed to sit up. All violently delirious patients were properly secured by tying them down to their cots by means of "clove-hitch" knots.

#### Medical Treatment.

Immediately on admission, plague patients were put on the following mixture :—

R—Liq. Strych.	...	...	...	M. v.
Spt. Ammon. Aron.	...	...	...	3 p
Spt. Etheris. Nitrosi	...	...	...	3 p
Aq. Mentha pip. ad.	...	...	...	3 i

every 4 hours ; along with this, they received from 4 to 6 ounces of rum during 24 hours, also a hypodermic injection of liquor strychninæ B. P. m.v. was given as a routine practice, three times daily, or every 4 hours in collapsed cases.

For nourishment they received milk and congee regularly during the day and night, and also egg flip every morning and evening. Delirious patients were fed by means of nutrient enemata.

#### Treatment of Bubo.

In some cases recovery took place even when absolutely no local treatment was applied to the bubo.

Generally when buboes were extremely painful, an application of glycerine and belladonna seemed to alleviate the pain.

The routine treatment for buboes was as follows :—A thick pad of absorbent cotton was soaked in 1 in 40 carbolic solution, and kept over the bubo by means of a bandage. This compress was renewed every 4 hours.

When a bubo showed signs of suppuration, poultices were sometimes used to hasten the process.

When actual suppuration had taken place in the buboes, they were freely laid open to facilitate the escape of sloughed tissue. The cavity was afterwards stuffed with strips of lint and iodoform and allowed to heal from the bottom. This procedure also prevented the pus from burrowing deeper, so that very seldom did a bubo need to be incised twice.

#### Treatment of Symptoms.

The various symptoms and complications arising during the course of the illness were treated as follows :—

*Pyrexia.*—If the temperature was above 103° F. Ice bag on the head, in over 105° F. cold sponging. Coal tar antipyretics were never used.

For delirium, ice bag on the head ; in a few cases blisters were tried. The usual treatment was the following mixture :—

R—Ammon. Brom.	...	...	...	3 p
Spt. Ammon. Aromat.	...	...	...	m x x
Liq. Strych...	...	...	...	m i j
Aq. Menth. pip. ad.	...	...	...	3 i

It was repeated after two hours if necessary.

In violent cases where immediate effect was desired, the hypodermic injection of  $\frac{1}{6}$  to  $\frac{1}{4}$  gr. of morphia, combined with 2 to 3 minims of liq. strychnine, had sometimes good effect.

The phlyctenule was treated with carbolic compresses, until it showed no signs of further spread of the inflammation at the base and until a distinct line of demarcation was formed. Poultices were then substituted, the slough was dusted over with iodoform, and finally the sloughed mass was removed by the knife or scissors. The ulcer left was dressed in the same way as the buboes.



Vomiting was treated by giving milk and medicines iced and by pieces of ice to suck by the mouth. Sometimes calomel gr. ij and santonine gr. j had a marked effect in checking it. Brandy was substituted for rum. Mustard plaster over the pit of the stomach. In very severe cases  $\frac{1}{6}$  to  $\frac{1}{2}$  gr. of morphia was hypodermically injected over the epigastrium with good result.

For thirst, soda water and ice to suck.

For headache, saline purgatives, ice bag on the head and bromide draught.

Constipation was relieved by means of calomel gr. v, aperients or enemata.

Diarrhoea was checked by astringents.

In melæna, calcium chloride gr. x to xv, 4 hourly, was tried with marked benefit.

The heart's action was mainly sustained by the hypodermic use of Strychnine as mentioned before.

Hæmorrhages were treated with full doses of calcium chloride.

Where pulmonary complications were present, cotton wool or flannel jackets were ordered and the following mixture, 4 hourly, was given :—

R—Vini Ipecac	...	...	...	m xv
Spt. Ammon. Arom.	...	...	...	3 i
Tinct. Scillac	...	...	...	m xv
Liq. Strychninæ...	...	...	...	m j j g
Aq. ad.	...	...	...	3 i

also injection of Strychnine as above, every four hours.

Sleeplessness was treated with a Bromide draught combined with half an ounce of rum.

Distension of the bladder, was relieved by hot fomentations, or failing this by means of a catheter.

Corneal ulcerations were treated with constant use of Boracic Acid drop, and compresses of Boracic Acid solution. No eyes were lost.

#### Special treatments. Staphylococcus

In 6 cases a small quantity of pus was injected into the buboes. In one the bubo, a left parotid one, suppurated and the patient made a good recovery. All the remaining cases died.

#### Roux's Serum.

28 cases were treated by Roux's serum. The cases have been fully described in the appendix.

#### Conclusion.

The Medical Officer cannot but conclude this report without expressing his deep obligation to Col. Wilkins, I. M. S., D. S. O., the Special Medical Officer in charge of Plague Operations, for his guidance and ever valuable advice.

The work of Prof. Müller and the Rev. Mr. Grey, who had charge of the "Discretionary Relief Fund," was gratefully appreciated by the patients, and their gifts of fruit, biscuits and toys were much enjoyed.

To the Rev. Father George, S.J., many thanks are due for his keen interest and for his exertions in securing plants and flowers for the hospital; and to Mrs. Nevin for her numerous presents of clothing for little children.

D. A. TURKHUDD, M.B.C.M.,  
Chief Medical Officer,  
Modikhana Hospital.

TABLE I.—Total admissions during the year.

Months.				Plague.	Relapsing Fever.	Observation Cases including all General Diseases.	Total.
June	1898	...	...	1	1	3	5
July	"	...	...	.....	.....	5	5
August	"	...	...	22	3	15	40
September	"	...	...	65	5	20	90
October	"	...	...	55	15	10	80
November	"	...	...	48	6	12	61
December	"	...	...	71	30	29	130
January	1899	...	...	218	19	77	309
February	"	...	...	284	11	99	394
March	"	...	...	330	7	128	465
April	"	...	...	124	6	52	182
May	"	...	...	54	4	47	105
Total				1,262	107	497	1,866

The largest number of weekly admissions was 140 for the week ending March 3rd, 1899, and the largest number of daily admissions were 21 on 2nd March 1899, 4th March 1899 and 6th March 1899, respectively.

The largest number of daily deaths was 17 on 3rd March 1899, 5th March 1899 and 13th March 1899, respectively.

Besides the admissions given above in Table I, 2,193 Bandar passengers were sent to this hospital for observation by the Port Health Authorities, as follows :—

*Bandar Cases.*

Months.							Number.
June	1898	...	...	...	...	...	130
July	"	...	...	...	...	...	83
August	"	...	...	...	...	...	161
September	"	...	...	...	...	...	302
October	"	...	...	...	...	...	311
November	"	...	...	...	...	...	383
December	"	...	...	...	...	...	586
January	1899	...	...	...	...	...	237
Total							2,193

During the year under report 194 contacts were admitted into this hospital, out of which 6 developed Plague.

*Total Weekly deaths and percentage of deaths to admissions.*

Week.						Admissions.	Deaths.	Percentage of deaths to Admissions.
Ending	2nd	June	1898	...	...	3	.....	.....
"	9th	"	"	...	...	1	3	300.0
"	16th	"	"	...	...	.....	.....	.....
"	23rd	"	"	...	...	1	.....	.....
"	30th	"	"	...	...	.....	.....	.....
"	7th	July	"	...	...	1	.....	.....
"	14th	"	"	...	...	4	.....	.....
"	21st	"	"	...	...	.....	.....	.....
"	28th	"	"	...	...	.....	.....	.....
"	4th	August	"	...	...	.....	.....	.....
"	11th	"	"	...	...	2	1	50.0
"	18th	"	"	...	...	8	3	37.5
"	25th	"	"	...	...	13	6	46.1
"	1st	September	"	...	...	14	4	28.5
"	8th	"	"	...	...	14	5	35.7
"	15th	"	"	...	...	20	14	70.0
"	22nd	"	"	...	...	20	11	55.0
"	29th	"	"	...	...	29	15	51.7
"	6th	October	"	...	...	30	15	50.0
"	13th	"	"	...	...	18	14	77.7
"	20th	"	"	...	...	19	11	57.8
"	27th	"	"	...	...	20	7	35.0
"	3rd	November	"	...	...	23	8	34.7
"	10th	"	"	...	...	23	14	60.8
"	17th	"	"	...	...	15	4	26.6
"	24th	"	"	...	...	17	7	41.1
"	1st	December	"	...	...	25	9	36.0
"	8th	"	"	...	...	19	8	42.1
"	15th	"	"	...	...	22	9	40.9
"	22nd	"	"	...	...	33	15	45.4
"	29th	"	"	...	...	27	14	51.8
"	5th	January	1899	...	...	41	23	56.2
"	12th	"	"	...	...	56	43	76.7
"	19th	"	"	...	...	64	42	65.6
"	26th	"	"	...	...	92	56	60.8
"	2nd	February	"	...	...	84	62	73.8
"	10th	"	"	...	...	100	67	67.0
"	17th	"	"	...	...	59	46	77.9
"	24th	"	"	...	...	110	67	60.9
"	3rd	March	"	...	...	140	95	67.1
"	10th	"	"	...	...	114	78	68.4
"	17th	"	"	...	...	104	73	70.1
"	24th	"	"	...	...	102	61	59.8
"	31st	"	"	...	...	85	52	61.1
"	7th	April	"	...	...	45	27	60.0
"	14th	"	"	...	...	48	32	66.6
"	21st	"	"	...	...	37	23	62.1
"	28th	"	"	...	...	42	29	79.0
"	5th	May	"	...	...	40	17	42.5
"	12th	"	"	...	...	41	21	51.2
"	19th	"	"	...	...	22	18	81.8
"	26th	"	"	...	...	14	8	57.1
"	31st	"	"	...	...	5	3	60.0
Total						1,866	1,140	84.3



TABLE II.

	Admissions.	Deaths.	Recoveries.	Percentage of Mortality
Plague ... ..	1,262	1,028	230	81.4
Relapsing Fever ... ..	107	23	86	22.5
Observation & other Diseases.	497	89	391	18.1
Total ... ..	1,866	1,140	707	.....

TABLE III.—All Diseases.

Months.	Total admissions.	Died with- in 24 hours.	Within 48 hours.	Total Deaths.	Total Recoveries.	Percentage of Deaths.
June 1898 ... ..	5	...	...	4	15	80.0
July " ... ..	5	...	...	...	5	...
August " ... ..	40	3	1	15	12	37.5
September " ... ..	90	27	4	52	27	57.7
October " ... ..	80	20	13	47	42	58.7
November " ... ..	61	33	1	37	26	60.6
December " ... ..	130	22	5	46	48	35.3
January 1899 ... ..	309	78	28	207	76	66.9
February " ... ..	394	88	55	253	124	64.2
March " ... ..	465	88	54	289	156	62.1
April " ... ..	182	30	21	116	100	65.3
May " ... ..	105	46	9	74	76	70.4
Total ... ..	1,866	435	191	1,140	707	...

TABLE III.—Plague.

Months.	Admissions	24 hours.	48 hours.	Total Deaths.	Recoveries.	Percentage of Deaths.
June 1898 ... ..	1	...	...	4	...	400.0
July " ... ..	...	...	...	...	...	...
August " ... ..	22	3	1	14	5	63.6
September " ... ..	65	27	4	47	9	72.3
October " ... ..	55	20	13	47	12	85.4
November " ... ..	43	33	1	35	9	81.3
December " ... ..	71	22	5	46	14	64.7
January 1899 ... ..	213	78	28	180	17	84.5
February " ... ..	284	88	55	224	32	76.8
March " ... ..	339	88	54	269	45	81.5
April " ... ..	124	30	21	101	44	81.4
May " ... ..	54	46	9	61	39	112.9
Total ... ..	1,262	435	191	...	...	...

TABLE III.—Relapsing Fever.

Month.	Admissions.	Deaths.	Recoveries.	Percentage of Deaths.
June 1898 ... ..	1	.....	1	.....
July " ... ..	.....	.....	.....	.....
August " ... ..	3	.....	1	.....
September " ... ..	5	3	3	60
October " ... ..	15	.....	14	.....
November " ... ..	6	.....	5	.....
December " ... ..	80	.....	13	.....
January 1899 ... ..	19	12	20	63.1
February " ... ..	11	3	15	25.4
March " ... ..	7	3	5	42.8
April " ... ..	6	.....	5	.....
May " ... ..	4	1	4	25.0
Total ... ..	107	22	33	.....

TABLE IV.—*Hindoos.*

	Total Admis- sions.	Deaths.	Recoveries.	Percentage of Deaths.
Males ... ..	1,331	815	514	61·2
Females ... ..	212	155	58	75·0
Children under 12 years ...	97	52	41	54·6

TABLE IV.—*Mussulmans.*

	Total Admis- sions.	Deaths.	Recoveries.	Percentage of Deaths.
Males ... ..	82	29	50	35·3
Females ... ..	10	5	2	50·0
Children under 12 years ...	4	1	3	25·0

TABLE IV.—*Christians.*

	Total Admis- sions.	Deaths.	Recoveries.	Percentage of Deaths.
Males ... ..	106	68	33	35·3
Females ... ..	13	8	3	71·5
Children under 12 years ...	8	5	2	62·5

TABLE IV.—*Jews.*

	Total Adm is sions.	Deaths.	Recoveries.	Percentage of Deaths.
Males... ..	1	1	.....	100·0
Females ... ..	1	1	.....	100·0
Children under 12 years ...	.....	.....	.....	.....

TABLE IV.—*Parsts.*

	Total Admis- sions.	Deaths.	Recoveries.	Percentage of Deaths.
Males ... ..	.....	.....	.....	.....
Females ... ..	1	.....	1	.....
Children under 12 years ...	.....	... ..	.....	.....

TABLE IV.

*Plague cases among Hindoos at the Modikhana Hospital during the year ending  
31st May 1899.*

	Total Admissions.	Deaths.	Recoveries.	Percentage of Deaths.
Males...    ...    ...    ...	862	725	139	
Females    ...    ...    ...	170	143	29	
Children under 12 years    ...	69	50	13	

TABLE IV.

*Plague cases among Mussulmans at the Modikhana Hospital during the year ending  
31st May 1899.*

	Total Admissions.	Deaths.	Recoveries.	Percentage of Deaths.
Males ...    ...    ...    ...	41	25	20	
Females    ...    ...    ...	6	4	.....	
Children    ...    ...    ...	1	1	1	

TABLE IV.

*Plague cases among Christians at the Modikhana Hospital during the year ending  
31st May 1899.*

	Total Admissions.	Deaths.	Recoveries.	Percentage of Deaths.
Males ...    ...    ...    ...	92	65	25	
Females    ...    ...    ...	11	8	1	
Children    ...    ...    ...	8	5	2	

TABLE IV.

*Plague cases among Jews at the Modikhana Hospital during the year ending  
31st May 1899.*

	Total Admissions.	Deaths.	Recoveries.	Percentage of Deaths.
Males...    ...    ...    ...	1	1	.....	
Females    ...    ...    ...	1	1	.....	
Children    ...    ...    ...	.....	.....	.....	



TABLE V.—Table showing the mortality for the year amongst sexes and children.

Total Mortality for the year.	Mortality amongst the men.	Mortality amongst women.	Mortality amongst children all under 12 years of age.
1,140	913	169	58

TABLE VI.—Showing Situation of Buboes.

Situation.	Total No. of cases.	Males.	Females.	Children.	Mortality	Recoveries.	Percentage of Mortality.
Cervical ... ..	79	45	20	14	50	25	61·2
Parotid ... ..	17	10	5	2	7	9	41·1
R. Axillary ... ..	109	77	25	7	94	16	86·2
L. Axillary ... ..	86	64	14	8	70	13	81·3
R. Femoral ... ..	56	45	5	6	48	5	85·7
L. Femoral ... ..	64	53	4	7	52	9	81·2
R. Inguinal ... ..	220	173	36	11	180	42	90·0
L. Inguinal ... ..	213	167	34	12	164	59	76·9
*Other Situations ... ..	18	11	4	3	12	6	66·6
No Buboes ... ..	294	255	32	7	266	33	90·4
Multiple Buboes ... ..	67	58	6	3	47	13	70·1
	1,223	958	185	80	990	220	80·9

\* Upper Eyelid 1

Left Lumbar 1

Sub-Mental 4

Pelvis 2

Check 1

Palm 1

Popliteal 1

Tochhar 1

Sub-Maxillary 6.

TABLE VII.—Pneumonic Plague without Buboes.

	Admitted.	Died.	Recoveries.	Percentage.
Males... ..	30	30	.....	100·0
Females ... ..	6	5	.....	88·3
Children ... ..	3	3	.....	100·0

TABLE VIII.

Table showing cases of secondary plague pneumonia (complicated with buboes).

This table is drawn from the 28 cases, which were treated with Roux's serum and which were kept under special observation ; 19 of these were found to be suffering from secondary pneumonic symptoms.

	Cases.	Died.	Recovered.	Percentage of Mortality.
Males...    ...    ...    ..	19	16	3	84.2
Females       ...    ...    ...	.....	.....	.....	.....
Children                ...    -	.....	.....	.....	.....

(1) In these cases the bacteriological examinations were carried on by Lieuts. Douglas and Walton of the I. M. S.

(2) Out of the above 19 cases, 13 were found to be suffering from secondary pneumonia on the day of their admission, three developed it on the second day, two on the third day and 1 on the fourth day after admission.

D. A. TURKHAD,  
Chief Medical Officer,  
Modikhana Hospital.

*Notes by the Special Medical Officer.*

The interesting Report by Dr. Turkhad is published in full. The work done by the hospital and staff is very good.

**No. 3.****Annual Report of the Maratha Plague Hospital,  
Bombay, from 1st June 1898 to 31st May 1899.****Situation.**

The Maratha Plague Hospital is situated to the north of the Victoria Gardens in E. Ward, Bombay. It is bounded on the north by the Connaught Road, and on the east and south by an extensive piece of vacant ground belonging to Mr. Bomanji Petit, and on the west by the back ground of the Western India Mills and some chawls and houses.

It occupies about 30,000 square yards of vacant ground belonging to Sir Dinshaw Petit and a strip of land measuring about 10,000 square yards belonging to the Bombay Municipality and now transferred to the City Improvement Trust.

The hospital premises are open on all sides except a portion on the west and north-west, where there are some chawls and small houses. It has a neat garden and the main entrance to the hospital is from the south.

The hospital consists of Plague Wards, Observation Camp, Contact Camp, and a Segregation Camp. There are seven Plague Wards each holding 24—36 beds, and four Observation Wards accommodating 80 patients, besides, there are six more wards running along the road side which hold 150 patients, so there is accommodation for 450 patients in this hospital. Each ward is about 60 feet long and 24 feet wide.

The Contact Camp is a long range of small well ventilated dry sheds accommodating 300 people, while the Segregation Camp consists of 15 sheds, which run along the road side and are separated by a distance of 300 yards from the Plague wards.

Each of these sheds is divided into 2 compartments and each compartment consists of 2 rooms. They are all open on all sides. They are intended for evicts and such other people who require temporary accommodation in a well ventilated and healthy locality until their houses are perfectly disinfected and made habitable. These sheds were mostly used by the labouring classes during the epidemics of 1898-99.

Besides these there are about 30 more sheds consisting of Dispensary, Office, House Surgeon's quarters, Nurses' quarters, Hospital Assistants' quarters, servants' quarters, store room, cook houses and other out-houses.

All these sheds are constructed of bamboos and zaolies, while the walls of each shed are made of split bamboos well plastered.

**Mortuary.**

The mortuary is situated in the south-east corner of the hospital compound. It has masonry walls and zaoly roof. It has a *pucca* chunam flooring, so that it could be washed daily with disinfectants.

**Latrines.**

There are five latrines and are situated at the four corners of the hospital to meet the convenience of the people. These latrines are also made of bamboos and zaolies with a *pucca* chunam and cement flooring, so that no sewage matter could be absorbed in the soil. Three of these latrines are connected with the main drain on the Connaught Road, while the other two latrines are situated on a low level and could not therefore be connected with the main drain. These two have well built cesspools from which sewage water, &c., is daily removed by the Municipal night-soil cart.

The water supply is from Vehar main. There are six bathing places built in different places in the compound for the use of the contacts, evicts and discharged patients.



The dhobi ghat is situated to the east and its water is carried to the main drain on the Connaught Road by means of an open masonry gutter.

The disinfecting platform is situated to the west end of the compound close to the Bhangies' quarters, and the waste water is carried to the main on the Sussex Road.

The compound is extensive, and the tastefully arranged flower pots along the sides of the *pucca* built road make the place a charming spot. The passages between the wards and the contact camp are also *pucca* built and are properly drained.

#### *History.*

The epidemics of 1896-97 had made Bombay desolate and the rich and the poor left their homes and went to live far off in distant lands, not minding all the discomforts, to avoid the dire malady, thereby paralysing the trade and industry of the city and threatening ruin on the City. But Bombay was again habited and everything went on as usual up to October of 1897, when unfortunately for the people a recrudescence of the plague broke out early in December 1897 and it was thought advisable to do something to keep the labouring classes from running away and thus avoid paralysis of trade and industry again.

Some of the leading men of the Maratha community at the instance of Sirdar Mir Abdool Ali, Khan Bahadoor, with the consent of Sir James Campbell, the then Plague Commissioner, met to consider the serious question, and it was resolved to call a meeting of the Marathas of all denominations and to open a hospital for all Hindoos except the lower castes of Mahar, Mangs, &c., where they could get several facilities and comforts of their homes and where their superstitious prejudices would be respected and the relations of the patients allowed to live in the same compound, so that they might not feel themselves forcibly separated from their dear ones.

A meeting of the Marathas of all classes was held under the presidency of Sirdar Mir Abdool Ali, Khan Bahadoor, about the end of December 1897, when it was resolved to build a hospital for the Marathas and to open a subscription list for carrying out the laudable object. It was also resolved to approach the mill-owners who had suffered a good deal during the first visitation of the epidemic and request their association and co-operation. Sirdar Mir Abdool Ali kindly promised to give his support to this scheme and went on collecting funds for the hospital from his friends and other charitable people. Sir James Campbell with the assistance of Sir George Cotton and Sir Dinshaw Petit collected subscriptions from mill-owners at the rate of Rs. 100 per each 2,000 spindles. The fund collected by the Sirdar was utilized in building sheds, making roads and other superstructures, while that collected by Sir James Campbell was spent in building latrines, drains, stand-pipes and other requirements of the hospital.

The work of erecting sheds was commenced on the 4th January 1898, and was carried under the direct supervision of Sirdar Mir Abdool Ali, Rao Bahadoor Dhondiba Hanmantrao Barde, and Rao Bahadoor Vitoba Krishnaji Vandeker, and two plague wards, one observation ward, a contact camp, segregation camp, office, dispensary and out-houses, &c., stood up like mushrooms within a period of 15 days. Cots, woollen blankets, bed sheets, kambliies, lamps, lanterns, dresses for the patients, &c., were supplied out of the fund collected by the Sirdar, while the Plague Committee undertook to maintain the hospital patients and the contacts and to bear the cost of the establishment.

Mr. L. B. Dhargalker, L. M. & S., was nominated by the Committee as an honorary Medical Officer in charge of the hospital, and Mr. Gangaram Dhurmaji was appointed as Vaidya of the hospital.

The work of admitting patients was commenced on the 21st January 1898. Day after day Maratha patients poured in and the wards were swarmed within a pace of fifteen days and new wards were run up to meet the increasing demand. In all ten wards were erected to accommodate 250 patients and a contact camp to accommodate 300 contacts. Besides these House Surgeon's quarters, Hospital Assistant's quarters, Nurses' quarters, servants' quarters, &c., numbering 76 sheds in all, have been erected one after another to accommodate the patients, their relatives and friends and the hospital staff.

In the monsoon the wards in the interior of the hospital compound were flooded with rain water, they being situated on a low ground and there being no proper outlet for it, and were found uninhabitable, so the segregation sheds, situated along the Comnaught Road line, which are built on a high level ground and which were found to keep dry during the rain, were used as hospital wards.

During the epidemic of 1899, there had been such a rush of patients at this hospital, that the ten wards situated within the interior of the compound were full, and more accommodation was found necessary to meet the increasing demand, so the wards along the road side used in the last rainy season for the hospital were made ready, and the convalescents, who numbered 120, were removed to these wards and room was made for new admissions. Also a new ward was built by the Sirdar to accommodate 40 patients.

The whole management of the hospital was transferred to the Plague Committee about the middle of February 1898. During all this time the hospital was in charge of Mr. L. B. Dhargalker and under the direct supervision of Major J. P. Barry, I. M. S. About the middle of February the number of patients went up to 150 and more medical aid became necessary. The Plague Committee therefore appointed Dr. C. Parsons, M.D. (London), as the Chief Medical Officer of the hospital on 20th February. The number of patients steadily increased and went up to 190 in the month of March 1898. This number includes the convalescent and the observation patients. With the decline of the Plague the number of admissions became less and less and the number of discharged patients increased, so that in the month of June there were only 20 patients left in the hospital.

The charge of the hospital was taken up by the Municipality in the month of July 1898, and since then it has been maintained by that body, while the building of new sheds, &c., is still carried on by the Sirdar.

The Maratha hospital is considered to be a model hospital, as it has its plague wards, observation wards, contact and segregation camps, all within the same compound, so that the patient's friends and relatives can live in the same compound, and the patient does not feel the pang of being forcibly separated from his people as was the case in other hospitals. It has been very popular amongst the poor classes who voluntarily seek admission into this institution.

The hospital authorities had to make allowance for the ignorance and prejudice of the people who are averse to go to hospitals, and had to create in them a taste for hospital life. Masses as a rule are quite ignorant of the comforts and tender nursing the poor receive in every hospital, but with persistent coaxing and allowing the patients and their relations certain indulgences, the poor people have taken a liking for this institution more than others.

The relations and friends of patients are freely welcomed on all occasions, are allowed to stay near their patient, and if possible to help the staff in nursing them. Some of these people are no doubt very useful in nursing the patients and do everything in their power to ensure comfort and happiness to them. In some cases these



poor people try to attend to patients who have no relations to look to them and who are lying on a cot next to that of their friend.

The patients at this hospital are given the option of being treated according to the European or Native system. Those who choose the latter are admitted in the wards in charge of the Native Vaidya, while others are put under the care of qualified medical men.

The patients are nursed by the nurses, ward boys, and ayahs. Patients who do not like to be treated by medical men in charge of the hospital are allowed to be treated by their own doctor or vaidya and are supplied with all the necessities and comforts that are available at the hospital.

Hindoos of all castes, except the lower classes of *Mahar* and *Mangs*, are admitted into the hospital, and special convenience is made for every high caste patient according to his position in life, so as to respect his superstition and prejudices. He is usually given a corner in the ward and is screened on all sides, so that his tender feelings may not be disturbed by the lamentable sight of the dying patients, and special care is taken to see that he receives his food from the Brahmin cook of the hospital.

#### Infection.

The patients' friends and relations having free access to the wards, the flooring of the wards being of mud, and the people walking bare-footed, it was surmised that those who visited or remained in the wards with the patients would be infected, but from experience it has been found that that fear could be minimized by the free use of disinfectants and by lime-washing the wards very often. Thousands of visitors must have trod on the flooring, but instances of these people being infected have been rare. As to infection amongst the hospital staff, there have been some cases, but these servants lived in the various infected parts of the town outside the hospital, and it is difficult to ascertain whether those who fell victims to the disease became infected in the hospital or outside. But here we have to turn to a sad page in the history of this hospital. It was about the middle of September 1898 that a Pneumonic plague patient was admitted into the hospital who died a day after his admission. Soon after a ward boy who attended on the patient was attacked with pneumonia. A few days after an Hospital Assistant died of the same. The late House Surgeon, Mr. Chonker was also attacked with Plague pneumonia and died within three days. After him two native hospital assistants, one compounder and one ward-boy, died of Plague pneumonia.

The cause of this infection was thoroughly investigated, but nothing was found wanting in the sanitary condition of the hospital, and while the staff thus suffered, the infection did not spread amongst the patients both in the Plague and Observation wards. Since then one sweeper, one contact clerk, and two ward boys died of Bubonic Plague.

#### Disposal of the dead.

No sooner is there a death in the wards, the body is removed to the mortuary and the cot and the clothing is thoroughly disinfected. In every case, where the body is claimed by the relations or friends of the patients, it is immediately handed over to them for disposal, but in many cases the relatives disappear and the bodies have been obliged to be disposed of at the Municipal expense. Every possible effort is made to inform the relatives or friends of the deceased, when known, and a reasonable time is allowed for them to come and dispose of the body. In some cases we have to wait for them from 12 to 15 hours, but when they fail to come, even after that



time, the corpse is removed to the cemetery at the expense of the Municipality. Four Hindoos of the Maratha community have been engaged by the hospital authorities for the purpose of removing and disposing of the unclaimed corpses, so that the feeling of the Hindoos may not in any way be hurt and their superstition and prejudices duly respected.

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### Statement of Pneumonic and other Plague cases amongst the Hospital Staff, *vide* Appendix.

(1). Raghoo Sackaram, a corpse-bearer, became sick on 3rd September, but did not report of his being ill until two days later, when he was found with high temperature and dyspnœa. He was admitted into the hospital and on examination he was found to suffer from pneumonia; there was restlessness, hæmoptysis and high temperature. He died 83 hours after admission.

(2). Govind Luxuman, a ward boy, became sick on 23rd September, had plague pneumonia and died on 24th, 23 hours after admission. This case had no connection with the above case. He was attending on a pneumonia case in the wards.

(3). Gopal Powar, an Hospital Assistant, was on night duty on 22nd September. He had to watch a bad case of Plague pneumonia and had spent the whole night by the side of the patient giving nutrient enemata, hypodermic injections, &c. On 24th September he was on day duty, and after working in the wards till 12 noon, he went home to his meals, but finding himself feverish, sent word that he was unable to attend to duty that afternoon. He was seen at his house by the House Surgeon, Mr. K. M. Chonker, the same evening, and was advised to go to the hospital for treatment. He was admitted next morning. Pneumonia had set in. He vomitted blood three or four times, was conscious up to the last. Died on 26th September, 14 hours after admission.

(4). Wife of Gopal Powar, who attended on him, fell ill on the 29th September, developed pneumonia and died on 1st October.

(5). K. M. Chonker, House Surgeon, got a cut on the left index finger on the 25th September while opening a bubo of a plague patient. He cauterised the cut and did not feel in any way uncomfortable up to the night of the 29th September, when he had a strong chill and rise of temperature. I saw him next morning and found him suffering from pneumonia. He then went to his house in Moogbhat, where I again saw him at 1 p.m. and found the temperature rising and sputa tinged with blood, but there was neither glandular development nor hæmoptysis. During the next two days that he lived, there was no change in the symptoms, but pericarditis set in and dyspnœa became intense. He was seen by Dr. Gallioti on 30th September. He died on 2nd October.

(6). Ramkrishna Govind, native Hospital Assistant, who now and then attended on Mr. Chonker, felt feverish on the 4th October. Dr. Gallioti was kind enough to see him on the 5th and was advised to undergo curative inoculation treatment, but he preferred the treatment of the Hospital Vaidya. His case was similar to that of Mr. Chonker. He died on 8th October. He was a young man of good constitution and regular habits.

(7). Balkrishna Ramchandra, a compounder of the hospital, attended on Mr. Chonker at nights. He became ill on 5th October. He was treated by the Hospital Vaidya. He had a small bubo in the right femoral region. He died on the 12th October.

(8). Balaji Babaji, a Dispensary boy and relative of Mr. Chonker, who used to attend on him, absented himself from duty on the 6th October and died on the 9th October. I have no intimation of his illness.

(9). Heera Megha, sweeper, reported himself ill on the 6th October, and was sent to the Arthur Road Hospital for treatment, where he died of Bubonic Plague.

(10). Hurrishundra Narayen, Native Hospital Assistant, reported ill on the 5th October. He now and then paid visits to Mr. Chonker during his illness, but I think he caught plague in his house situated in Moogbhat Lane, his brother having died then on the 8th October of Pneumonia plague. I saw him at his house on the 11th and advised him to go to the hospital, where he preferred the treatment of the Hospital Vaidya. He had pneumonia and died on the 13th October. His other brother who came to see him also died of the same.

(11). Sadashiv Anandrao, a ward boy, who attended on Mr. Balkrishna, Compounder, reported himself sick on 13th October. He had very high temperature and strong headache and diarrhoea. He was treated from the onset and got over the symptoms on the fourth day and was discharged cured.

(12). Dhondoo Bhagoo, a dresser, was admitted into Plague ward on the 7th of November 1898, and was found to suffer from pneumonia. He died on the 9th of that month.

(13). Dewji Babaji, a ward boy, was admitted on the 6th February 1899 with high fever and pneumonia. He had hæmoptysis and blood stained sputa. His blood was sent for bacteriological examination and was diagnosed as a case of relapsing fever. He died on 12th February 1899.

(14). Mahadowrao Crishna, contact clerk, became ill on the 7th February and was treated for fever. He developed a right femoral bubo on the third day of his illness and died on the 4th February.

(15). Wittoba Dowlata, a ward boy, was admitted into the hospital on the 19th May 1899 for plague with a femoral bubo. He died on the 20th May.

(16). Dhondoo Govind, a ward boy, died of Plague in the Modikhana Hospital.

All these persons, except Mr. Chonker and Mahadowrao Crishna, lived outside the hospital, mostly in infected localities, while Mr. Chonker and Mahadowrao went to visit their friends in the town very often.

*List of Names of the Members of the Committee formed for Establishing the Maratha Hospital.*

1. Sirdar Mir Abdool Ali, Khan Bahadur, Founder and Patron of the Hospital.

*Names of the Members of the Committee.*

1. Rao Bahadur Kooshaba Chapaji Kale ...	...	...	President.
2. Rao Saheb Ghamaji Balaji Rukhare ...	...	...	} Members.
3. Rao Bahadur Dhondiba Hunmantrao Patil Burde ...	...	...	
4. Raghoonath Babu Saheb Malap, Esq., J. P. ...	...	...	
5. Sadashiv Succaram Hande, Esq. ...	...	...	
6. Appaji Sadashiv Dongre, Esq. ...	...	...	
7. Tookaram Sutwaji Hande, Esq....	...	...	} Treasurer.
8. Tookaram Jaoji, Esq., J. P. ...	...	...	
9. Rao Bahadur Vittal Krishnaji Vandeker, J. P. ...	...	...	
			Secretary.

*List of the Office Staff, Nurses, &c.*

No.	Names.	Designation.
1	L. B. Dhargalkur, L. M. & S. ...	Chief Medical Officer.
2	N. B. Lam, L. M. & S. ...	Assistant Medical Officer.
3	Suntooji Ramji, Esq. ...	Hony. Surgeon.
4	E. H. Hate, Esq. ...	"
5	Gungaram Dhurmaji, Esq. ...	Native Vaidya.
6	Miss Green ...	Sister.
7	" Moore ...	"
8	" Richardson ...	"
9	" Winscom ...	"
10	" Barrow ...	"
11	" Hale ...	"
12	" Holmes ...	"
13	" Greening ...	"
14	" Murphy ...	"
15	" Hyland ...	"
16	" Boyd ...	"
17	Mrs. Cannon ...	Nurse.
18	Miss Wells ...	"
19	" Rozario ...	"
20	" Burnard ...	"
21	Mr. Manockji Dossaboy ...	Hospital Assistant.
22	" G. R. Padhay ...	"
23	" Harrishunkur Hurnarayan ...	"
24	" G. DeAndrads ...	Student.
25	" D. F. Sunjana ...	"
26	" R. P. Chaliaha ...	"
27	" Succaram Gopal ...	Native Hospital Assistant.
28	" Mahadeo Dewji ...	"
29	Compounders ...	Two.
30	Clerks ...	Four.
31	Peon ...	One.
32	Ward-boys ...	Twenty-six.
33	Ayals ...	Fifteen.
34	Cooks ...	Three.
35	Corpse bearers ...	Four.
36	Dhobies ...	"
37	Bhisties ...	Two.
38	Lime washers ...	Twelve.
39	Coolies ...	Four.
40	Musal ...	One.
41	Sweepers ...	Twenty-nine.
42	Ramosies ...	Two.
43	Native compounder ...	One.

## CLINICAL OBSERVATIONS.

The cases admitted into this Hospital were generally in a very low condition of health and about two-thirds of them were moribund, many of whom had practically passed all help. Out of 4,485 admissions during the twelve months under review, 1,649 were voluntary admissions, while 2,836 were sent by several District Officers. The plague authorities sent the patients in ambulances, while the voluntary cases came either walking all the way or were brought in hack gharies or victorias, and it was always strange to see how people, with painful buboes in the groin, with high fever or with pneumonic symptoms, walk a distance of a mile or two to come to the hospitals, and when admitted, die within a few hours. Surprise is often expressed by the outside public that the man apparently well should die within so short a time in the hospital, and it is still believed that doctors have orders from Government to kill patients in the hospital in order to stop further ravages of the epidemic. At times



the patients were found dead in the ambulances, and it was said that the bedding was saturated with a deadly poison which killed a person no sooner he slept upon it. But the people have now learnt that there was no truth in these rumours, and the patient gets confidence after a stay of a day or two in the hospital.

#### GENERAL SIGNS AND SYMPTOMS OF PLAGUE PATIENTS.

The onset of the disease is very sudden, a person apparently well, perhaps on work feels a sudden chill or rigor, complains of severe headache accompanied with or without vomiting. The skin becomes hot, but the patient does not think of going to bed, he thinks that there has been nothing serious with him, but a little indisposition, especially a bilious attack. He tries to work as usual, the temperature rises to  $104^{\circ}$ — $105^{\circ}$  F., the patient feels some pain in the groin or armpit or the neck and finds that he is unable to work or do anything else but take to bed. When removed to the hospital the temperature varies. The maximum temperature noted on admission is  $105^{\circ}$  F. and the minimum  $98^{\circ}$  F. which has tendency to rise to  $102^{\circ}$  F. or  $103^{\circ}$  F. after a few hours.

*Gait.*—The gait of a plague patient is, as a rule, tottering when the patient is able to walk.

*Aspect.*—The aspect of the patient is always very characteristic and when once seen is never forgotten. The features appear as if depicted with fear and anxiety as if from fear of impending death. In some cases the patient has a maniacal look with blood shot eyes. In the comatose condition he has a dull or drowsy look with eyelids half closed and the face more or less cyanotic.

*Speech.*—The speech of a plague patient is no doubt characteristic. It is of two kinds—(1) the words thick and broken up into syllables and articulated with difficulty in a more or less husky tone, and (2) the words are uttered as it were in a irritable or an angry tone.

*Temperature.*—Rise of temperature attracts early attention of the patient or his friends. It varies from  $100$  to  $107^{\circ}$  F., but the usual range of temperature is between  $102$ — $105^{\circ}$  F. No regularity could be seen in the chart of any two cases. Generally there is a continuous rise for three or four days, and then there is a sudden fall indicating collapse or sudden death, or the temperature becomes intermittent with a remission of  $1$ — $2^{\circ}$  F. every day, but the remission does not occur always in morning as in other inflammatory fevers, but in some cases the remission is in the evening. The fall of temperature by lysis may go on up to 7 or 8 days in cases which are likely to recover, while in other cases it again rises and after two or three days remission to  $105$  or  $106^{\circ}$  F. the case ends fatally. In some cases, it is observed that the temperature comes down to normal on the second, third or fourth day, rises suddenly the next day and again falls below normal, the case ending fatally. In a case of septiæmia the temperature chart is very characteristic, the rise in the evening and the fall in the morning are well marked. In cases where suppuration of the bubo or sloughing is extensive or deep-seated, the temperature rises and falls day after day until the patient improves.

*Buboes.*—The appearance of a bubo with rise of temperature is considered to be a sure symptom of plague, and the patient complains more about it when it was tender and painful. It appears along with the rise of temperature or after two or three days and in some cases it appears even after six or seven days. The appearance of a bubo is usually characterized by pain and tenderness, but in a few cases neither of them are present and the patient feels no discomfort even if the bubo be pressed hard. The size of a bubo varies from that of a small pebble to that of a big orange, but smaller the bubo, more excruciating is the pain and more danger to the patient. Swelling in and around the bubo is well marked. It is due to infiltration

of the glands or to effusion of serus or sero-sanguinous fluid in the cellular tissue around the glands. It varies in extent and intensity in various cases. It is of grave import in cases of axillary and cervical buboes as it involves the vital parts. Once a bubo has appeared, it ends either in resolution, or suppuration and sloughing. Sometimes a bubo remains indolent for a long time before it effectually suppurates. In four-fifths of the cases which are likely to recover, the bubo suppurates, but in some it is also accompanied by sloughing. The extent of sloughing varies a great deal. It may be confined to the skin and the connective tissue over the area of infiltration around the bubo, or penetrate deep beneath the sheaths of muscles exposing them. This is generally the case when the bubo is situated in the femoral or axillary regions. In the scarpas triangle the sloughing is so deep that the muscles, superficial arteries and veins are laid perfectly bare as if the part was perfectly dissected. Two such cases were seen in this hospital and wound was so deep that one could easily place his fist in it. The same is the case in the axilla, but there the infiltration is so much that a large surface of the pectoral muscle is exposed, the vital parts are involved and there is speedy termination of the case. In one case after the slough was removed tetanus set in and the man was carried off within two days. Sloughing is also caused by the application of marking nut or by actual cautery to which the poor natives resort with a hope of curing the patient. Out of 595 cases which recovered the buboes suppurated in 482 only.

*Blebs or Blisters* containing serous fluid were sometimes seen on various parts of the body of a plague patient. It starts as a small bleb or blister, the skin of the part becomes dark green and icy cold. The patient puts down the swelling to the formation of a guineaworm, and insists upon his suffering from that disease and not from plague. In one case a gangrenous patch appeared on the left lobe of the ear which I think a very uncommon position. Ulcers or carbuncles are seen in some cases. They generally begin as a small hard nodule under the skin, which sloughs in the centre while the surrounding surface rises above the centre and is of stony hardness; then it undergoes peculiar changes, and the tissue below it die and leave a cup-shaped depression. One case worth noting here was that of a Maharatha youth aged 22 years, who was admitted in the plague ward for fever and right femoral bubo. He first showed a small nodule on the right cheek, this was ordered to be poulticed, next day a depression was seen at the place of the nodule and the surrounding surface became hard and indurated and the whole face swollen. Poultice was continued, but the next day the face became more swollen and the patient was not able to swallow without difficulty, as there was fluctuation perceived in the swelling an incision was made into it, but nothing came out. Poultice was continued next day the whole face was erysipelatous and the man was not able to swallow, but under treatment the swelling gradually went down, the slough came off, and there was a large angry-looking ulcer left. This gradually healed and the man was discharged cured.

*Abscesses.*—Abscesses are formed in various parts of the body, especially in septicæmic form of plague. They burrow and form long sinuses, very troublesome to heal and exhaust the patient's strength. A case of septicæmic abscesses worth noting is that of a boy 13 years old, admitted into the hospital, with right femoral bubo. He appeared lively on admission, but was found delirious in the evening. In the morning it was noticed that he had gnawed his two fingers up to the second phalanx, and, apparently he had swallowed the pieces he gnawed. He used to take all his food, but was not conscious and always lay prostrate on the back. Later on, the femoral bubo sloughed and left a dissected ulcer in the scarpa's triangle, and eleven abscesses formed one after another from the head to foot, all these were opened; but those



in the arm and leg had burrowed to such a length that they had formed communication with abscesses situated in the other end of the leg or arm. The boy at last died 21 days after admission in the hospital. He was ailing for 13 days before admission.

*Petechiæ*.—Small hemorrhagic spots have been observed in two cases only in this hospital. They covered the greater part of the body, especially the back and the shoulder. A Brahmin boy, aged 18, was admitted for fever in the hospital, next day he developed a left femoral bubo and was transferred to the plague ward; on the next day small hemorrhagic spots were observed all over the body, which disappeared on the fourth day. The bubo subsided and the boy was discharged cured. The case was a complicated one as would be seen from the Temperature chart, which is that of relapsing fever, but the development of the bubo is most puzzling.

*Eyes*.—Eyes as a rule are injected and suffused in every well developed plague case. In some cases there is sub-conjunctival hemorrhage, while in others there is ulceration of cornea, prolapse of the iris and total destruction of sight. A case admitted in this hospital and still under treatment and worth noting is that of a Pardeshi gardenor. He was admitted for plague in the plague ward. His eyes were ecchymosed and there was a white ring round the upper half of the cornea, pupils were drawn upwards and the patient was not able to see anything. Gradually the ecchymosis and the redness subsided and the eyes looked as if operated upon for cataract, this appearance remained for a long time and his sight began to recover gradually, now the eyes are quite normal and he can see everything very clearly.

*Tongue*.—Tongue is characteristic. It is dry, covered with a thick white fur; as the case gets worse the fur becomes yellowish brown or even blackish.

*Vomiting*.—Vomiting is very common in plague. It is often yellowish in colour and has sour acid smell. In many cases it is persistent and is very difficult to control. Sometimes a patient vomits large quantity of blood and dies all of a sudden.

*Hiccough*, is a very distressing complication, but is not very common. It yields to remedial measures, but soon reappears. In one case it persisted for twelve days and then disappeared, but it is more observed in relapsing fever cases, where it commences two or three days previous to the expected relapse, and persists during the time the temperature is high.

*Constipation*, is complained of in many cases and the patient feels relieved after a dose of a purgative mixture or a copious enema of soap and water.

*Diarrhœa*, is another distressing complication, the stools are very offensive. It does not easily yield to treatment and indicates a speedy termination of the case.

*Pulse*.—The pulse of a plague patient varies in its frequency, force, volume, and tone. The full and bounding pulse associated with high fever is generally absent and in its place we find a feeble, frequent running pulse, with a tendency to become intermittent or often distinctly dicrotic, and then there is failure of heart's action. It may be gradual or sudden. In the former, the pulse becomes imperceptible, temperature falls below normal, the skin is cold and clammy and the patient dies; but when the failure of the heart is sudden, the patient apparently looking better, talks sensibly, tries to sit up or attempts to get out of bed, after some such sudden exertion, falls down and dies.



*Respiratory System.*—Increased frequency of respiration is one of the common symptoms that attracts early notice in a plague caso. There is congestion of the air passages and one or both lungs become involved, due to a chill or some such external cause, or hypostatic congestion sets in with the length of time the patient has been in one particular position.

Primary plague pneumonia is not very common, but is most fatal and highly infectious, signs and symptoms are very distinct. There is high continuous fever, there is dullness at the bases, crepitations are distinctly audible, there is dyspnoea and blood-stained sputum, in many cases there is hæmoptysis, but bacteriological examination is of great importance. There were cases of primary pneumonia treated in this hospital, but bacteriological examination was made in thirteen cases only.

*Nervous System.*—The nervous system is affected from the very beginning of the disease. The first complaint of the patient is headache. In some cases it is very severe. In others it is accompanied with vertigo.

*Delirium*, is a very common complication. It generally sets in on the second or third day of the disease. It may be acute or low muttering delirium. In the acute form the patient is violent, gets out of his bed and tries to escape from his keepers. In one case the patient at the dead of night jumped out of the window, entered the other ward and tried to jump through another window, but was caught hold of and taken back to his bed. One patient quietly walked through the ward and went like a sane person to Colaba, where he fell exhausted and was carried to the Modikhana Hospital, where he died. In another case the man became so violent that he struck six persons and would have strangled the ward-boy if there would have been no assistance at hand. In one case, the patient developed a homicidal tendency and when he had got over it he absconded from the ward. In some cases the patients stealthily get under another patient's cot, while others go on rolling in their bed and lie half way down their cot with the head about its middle and the feet resting on the floor. One patient in his delirium uttered the words *Shivshanker* in a convulsive manner continuously for about ten minutes and then stopped as if exhausted for about five minutes to repeat the name.

In cases of low muttering delirium the patient lies in a semi-prostrate condition, picking at the bed clothes, or some imaginary object, muttering something in a low, husky voice.

*Complications observed amongst Plague patients admitted in the Hospital.*

Complications.							No. of patients.
Unconscious	...	...	...	...	...	...	40
Delirium	...	...	...	...	...	...	380
Inco-ordination of the lower extremities	...	...	...	...	...	...	5
Vomiting	...	...	...	...	...	...	2,130
Diarrhoea	...	...	...	...	...	...	246
Affection of speech	...	...	...	...	...	...	43
Hæmoptysis	...	...	...	...	...	...	156
Hæmatemesis	...	...	...	...	...	...	6
Hæmaturia	...	...	...	...	...	...	4
Retention of Urine	...	...	...	...	...	...	52
Abortion	...	...	...	...	...	...	6
Conjunctivitis	...	...	...	...	...	...	1,867
Hypopion	...	...	...	...	...	...	22
Secondary Pneumonia	...	...	...	...	...	...	99

*Complications.*—The usual complications in a plague case are—headache, delirium, diarrhœa, vomiting, hiccough, retention of urine, hæmorrhage and secondary pneumonia. Besides these the eyes are very often involved there is either subconjunctival hæmorrhage or hypopion. Hæmaturia is rather rare, hæmoptysis and hæmatemesis, melœna being very common this year. Abortion occurred in all pregnant women, the cases ending fatally.

*Mortality.*—The plague mortality at this hospital this year has been very heavy, *i.e.*, 80·8 per cent. 1,001 patients out of 3,104 plague patients admitted in the hospital died within 24 hours after admission, a greater number dying within a few hours, and some patients died within a few minutes, and a few were found dead in the ambulances. 545 patients died within 48 hours. If the number of deaths between 24 and 48 hours be excluded from the total plague mortality, the remainder gives an average 62·06 per cent. of mortality. It appears that the heaviest mortality was amongst those patients who had no apparent bubo and most of whom showed signs and symptoms of pneumonia.

*Mortality according to the position of buboes.*

1. Axillary	...	...	...	82—83	per cent.
2. Parotid	...	...	...	82·6	„
3. Inguinal	...	...	...	76·80	„
4. Cervical	...	...	...	76·1	„
5. Femoral	...	...	...	76—78	„
6. Multiple	...	...	...	70·9	„

The most important cause of death is failure of heart's action. In cases of axillary, cervical, and parotid buboes, it is due to extension of inflammation to the deep connective tissues and the larynx. Hæmorrhage from the lungs has been the immediate cause of death in many cases. Hæmatemesis was observed in 4 cases, while hæmaturia in 3 cases only. Melœna was also a very common cause of death when diarrhœa supervened.

*Convalescence.*—Convalescence of a plague patient is extremely tardy and the patients go on lingering for months together. The shortest period is 20 days and the longest was 6 months. The wounds and ulcers heal very slowly; the general strength of the patient is not recovered as in other diseases, but above all some indiscretion on the part of the patient or his friends in taking some injudicious food or over-feeding himself brings on complications, such as diarrhœa, cough, &c., and retards recovery.

*Sequelæ.*—The sequel of plague is general constitutional weakness which remains for a considerable time even after the patient is discharged cured from the hospital. Aphasia and incoordination of the upper and lower limbs are seen in a few cases but it is temporary. The patient gets his speech and power of locomotion gradually. In two cases it took six months for them to be able to speak well, and one case lately discharged got tired of remaining in the hospital and requested to be discharged. Her husband having promised to look after her she was at last discharged partially cured of her aphasia. In one case there was ascites due to incompetency of the heart. In some cases there is arthritis which remains for a long time after the patient has been convalescent.

*Incubation.*—It is very difficult to state the exact period of incubation in plague. The class of people admitted in this hospital are always not exact in their statements as to facts. They always state that it was only the first or second day of the attack, but from what has been observed amongst the contacts it could be easily said that the incubation period varied from 3 to 7 days. In one case only I have



observed that it extended for 21 days. A woman was admitted in the observation ward who showed a continuous fever chart, but to my great surprise she complained of pain in the sublingual region on the 21st day and developed a bubo, which suppurated, patient grew worse and ultimately died. It is doubtful whether in this case the incubation period extended over 21 days or she caught the poison in the ward from some other patient under observation.

*Treatment.*—The treatment of plague cases followed in this hospital is of two kinds. The European system and the Native system of treatment.

*European system.*—Plague is such a fell disease that no drug has yet established its claim for being a specific or something near it in the case of well-developed plague cases. Drugs are no doubt of considerable value, but their value is limited. They have shown by their actions how their uses vary and how the system under the influence of plague poison could tolerate enormous, even actual, poisonous doses of certain drugs.

The line of treatment adopted in this hospital is as follows :—

No sooner is the patient brought to the ward, than he is put on a cot, having for his bedding a kumbly, a white sheet and a blanket to cover. A piece of mackintosh is placed over the bed and the patient is made to lie down on it. He is then washed with a carbolic acid lotion diluted. All his clothings are burnt, and he is given hospital clothing. He is then given a dose of stimulant mixture and four ounces of milk. The further treatment of the case is more or less symptomatic. (1) To control the febrile state, Diaphoretics or Antipyretics are not used to bring down the temperature as they have a deleterious influence on the heart, and have been found to do more harm than good. Reliance is therefore placed on the application of hot or cold pack and ice to the head to bring down the temperature. Continuous sponging brings down the temperature, but only for a short time. Patients in this hospital prefer hot pack, and I believe it is an efficient measure of controlling the temperature. (2) To control delirium Bromide of Potassium and Hyoseyamus is usually persisted in the acute cases, but when the patient is very violent resort is to be had in subcutaneous injection of Hyescine. It works efficiently but is a strong depressant and care must be taken to stimulate the patient after the injection.

Ice bag to the head is of very little use as the patient does not keep quiet and tears the bag into pieces. In low muttering delirium, stimulants are of great value. To support the heart's action, a mixture of Ammonia Carbonas, Strychnia, Digitalis, Caffeine Citras and Rum is continued every four hours day and night. But when the patient is quite unconscious or not able to swallow and the heart is failing, he is given two hourly injections of Strychnia, Strophanthus and Rum.

To control diarrhoea, an astringent mixture or Dermatol is generally resorted to but these have no effect; an astringent enema is tried and succeeds in many cases.

To control hæmorrhage from the lungs, stomach or intestines, more reliance is placed on Calcium Chloride than Hazeline and other astringents.

To control plague poison itself several drugs in various combinations have been tried without any satisfactory results. Liquor Hydrargyri Perchloride in one drachm doses was once said to have wonderful effect in controlling the plague poison, and was given a long trial in this hospital, but it proved to be of little value. Similarly, Liquor Hydrarg. Perchl. and Carbolic Acid in one minim doses, then a combination of Tinct. Iodi, Acid Carbolic, Liquor Strychnia and Glycerine were tried, but the results were in no way encouraging. A mixture of Liquor Hydrarg. Perchl. and Pot. Iodid. which is supposed to form an efficient germicide, was tried



for a long time and gave better results than the above mentioned drugs, but it was always combined with Strychnia, Digitalis, and Rum, so it is difficult to credit some recoveries to these drugs only. Other germicides such as Tetra Chlor. Iodi and Amber emulsion as recommended by some persons were tried in half a dozen cases, but the result was in no way encouraging.

Pneumonic cases were treated on general principles. They were as a rule isolated from other plague patients; that is, they were kept in a separate ward built for pneumonic cases only.

The chief factors in the treatment of plague cases are judicious nursing and stimulants. Acute cases are kept on milk diet only. When the patient is delirious or is not able to take his nourishment owing to the swelling of the tongue or epiglottis, he is fed through the nose by the Esophageal tube. This process, though difficult, is very effective. When there is some constriction in the pharynx and the patient could not be fed by the Esophageal tube or when there is constant vomiting and the patient is not able to retain anything, nutrient enemias are given every four hours. These are generally retained and the patient's strength is sustained until he is able to take his food by mouth.

*Sero-theurapy.*—Professor Lustig's serum was tried by Dr. Gallioti in 13 cases in this hospital, out of which three recovered. All these cases were early cases and were selected by Dr. Gallioti himself. It was observed that about two hours after the injection the patient felt sudden depression of spirits and was revived after a dose of stimulants. In one case a patient died an hour after injection. All the patients who died, died after the third or fourth injection of sudden failure of the heart. In one case there was diarrhoea and in another secondary pneumonia.

*Native system of treatment.*—699 cases underwent native treatment, out of which 573 died, giving 82.1 percentage of mortality. All these cases were early cases and were conscious enough to prefer the treatment they wanted to undergo. The nostrums prescribed to the patients were in the form of decoctions, the prescription of which is a secret known to the Vaidya only and which he is loath to divulge.

*Bath treatment.*—About the beginning of January 1899, Mr. A. Leslie got permission from the Special Medical Officer in charge Plague Operations, to try the vapour bath treatment on plague patients in the Maratha Hospital. A shed on the north of the hospital was built and fitted for that purpose. At first work was begun with primus stoves with four burners, but later a small engine was fitted outside the shed and galvanised iron pipe fitting was made into the shed. There was room for two patients at a time. Mr. E. H. Hate was placed in charge of the bath and Lieut. H. I. R. Twigg, I.M.S., was appointed supervisor. During four months that the bath treatment was tried, 565 cases were taken. Each case had one, two or as many more baths as were found necessary. The largest number of baths given to one patient was eight, including the hot and cold baths. The total mortality amongst these patients was 80 per cent.

Making allowance for moribund cases and for undue proportion of males treated, female cases were more fatal than male. All the cases under bath treatment were also treated with drugs usually prescribed for other plague cases. On the whole it seems that bath treatment had very little or no effect in reducing the mortality of plague, but at times the symptoms were aggravated and the patient's life was found in imminent danger (*vide* Appendix).

*Diagnosis.*—The diagnosis of plague when well developed is not difficult, but it may be mistaken for relapsing fever, remittent fever or typhus fever in their early stages. There was only one case of mumps admitted in this hospital and was diagnosed as that of mumps and not mistaken for plague.

*Disinfection.*—Disinfection of the patient and his clothing.—A patient when brought to the wards is stripped off of his clothing, and is made to lie on a cot with a piece of mackintosh underneath. He is then washed with a two per cent. solution of carbolic acid in luke warm water. All his clothing is burnt and he is put in a clean hospital suit. The bedding of a patient, which consists of a kumbli, a white sheet and a blanket is changed as often as it is soiled or every other day when not soiled.

When a patient dies, his cot is removed outside in the compound, washed with a solution of Perchloride of Mercury and is exposed to the sun for a day or two before it is used again. All the soiled and other clothing are removed every time to the disinfection platform, where they are steeped over-night in a solution of Perchloride of Mercury made according to the following formulæ :—

Perchloride of Mercury	...	...	...	...	9 ozs.
Acid Hydrochloric Fort	...	...	...	...	13½ ozs.
Water	...	...	...	...	72 gallons.

Next morning all the clothes are washed clean by the sweepers engaged for that purpose and handed over to the Dhobi for the final wash. When the hospital clothing is much soiled and found unfit for further use, it is immediately destroyed by fire.

Sputum of the patient is collected in earthen chatties or enamelled spittoons, containing quantity of sanitas powder or a solution of phenyle. These chatties and spittoons are removed to the latrines twice a day where the contents are thrown away and washed clean with phenyle solution. Every patient is made to pass his motion in a bed pan and urine in a urine bottle. These are immediately removed to the latrines, the contents thrown out and are washed clean with a Perchloride Mercury solution and kept exposed outside the ward.

The sides and flooring of every ward are lime-washed every week, while the flooring is swept and watered with a solution of Perchloride of Mercury and made sweet with sanitas powder twice a day. The poultices, used bandages, &c., are burnt and not used again.

*Disinfection of the contacts.*—The names of all persons sent as contacts are registered; they are then made to take a bath with a two per cent. solution of Carbolic Acid. All the clothing on their person is sent for washing and new clothing and blankets are given to them for the time their clothing is disinfected and washed and is made ready for wear; all the kit, clothing, &c., belonging to the contacts and the patients are sent to Naralwadi sterilizer for disinfection. These things are generally returned after 3 or 4 hours when the sterilizer is working, and the kit thus disinfected is again given in charge of the contacts to whom it belonged. Two or three persons of one family sent as contacts are given a room in the contact camp, where they are to keep their things and sleep, and they cook in separate cook house situated on the east. The bedding, &c., used by the contact is exposed to the sun every day. The rooms in the contact sheds are limewashed everytime they are vacated and before new contacts are put in. On the 11th day of their admission the contacts are discharged and are then made to take a bath with a two per cent. solution of Carbolic Acid and put on disinfected clothing, or in cases when there are no spare clothes, they are supplied from the hospital. There are four blocks of latrines in the hospital compound. Two blocks contain seven seats in each, one block has six seats, and the fourth block has three seats only. All the latrines are washed every day with Perchloride of Mercury solution and the night-soil and the sewage water is removed every morning in a Municipal night-soil cart.



The whole compound and the out-houses are cleaned and swept every day and all the rubbish is destroyed by fire. The dispensary, offices, and other sheds are limewashed as often as found necessary.

The mortuary is washed every day with Perchloride of Mercury solution.

*Statistics.*—The total number of admissions in the hospital from all causes from the 1st of June 1898 to 31st May 1899 was 4,485. 2,836 patients were sent by the District Officers from various parts of the town, while 1,649 patients came in voluntarily. Out of the total admissions there were 2,789 cases sent as plague cases, while the remaining 1,696 were sent for observation. Out of these 1696, 315 cases developed into plague, 324 into relapsing fever, and the remaining 987 were cases of other diseases, such as intermittent fever, remittent fever, bronchitis, diarrhoea, dysentery, jaundice, &c. The total number of deaths from all causes during the year under review was 2,814, out of which 2,509 were from plague, 37 from relapsing fever, and 268 from other diseases.

There were 3,033 people sent as contacts to the contact camp, out of which 57 persons developed plague, *i.e.*, only 1·85 per cent. suffered from plague.

The largest number of admissions in this hospital was 46 on the 2nd March 1899. The largest number of deaths was 35 on the 20th of March, and the largest number of patients in the hospital was 320 on the 23rd of March 1899.

As to Professor Haffkine's prophylactic inoculations, only one case was admitted into this hospital, quite in an unconscious state on the 26th February 1899 and died an hour after. It was of a female aged 59 years in a very debilitated condition of body. She was inoculated a month prior to her attack at the Mazagon inoculating station with 2 c.c. Haffkine's prophylactic.

The tables herewith annexed give the details of total admissions, number of cases of plague, relapsing fever, and other diseases, and the number of deaths that occurred in each; the position of buboes and the number of attacks and deaths in each; the number of males, females, and children under 12 years and the number of deaths in each sex and their percentage; so also the number of primary and secondary pneumonic cases occurring in males, females, and children with the number of deaths and recoveries in each. The patients admitted into this hospital were all Hindus and table form shows the number of deaths, recoveries, and percentage amongst Hindu males, females and children under 12 years, while a separate list is annexed showing the number of persons of different Hindu communities admitted into the hospital.

TABLE I.—*Total admissions during the year.*

Months.				Plague.	Relapsing Fever.	Observation cases including all general diseases.	Total.
June	1898	...	...	18	4	30	52
July	"	...	...	55	2	51	108
August	"	...	...	99	41	79	219
September	"	...	...	158	60	59	287
October	"	...	...	108	62	70	240
November	"	...	...	29	22	59	110
December	"	...	...	98	38	104	240
January	1899	...	...	430	55	167	652
February	"	...	...	769	33	103	905
March	"	...	...	893	33	96	1,022
April	"	...	...	326	28	87	441
May	"	...	...	121	16	72	209
Total				3,104	394	987	4,485



TABLE II.

				Admis- sions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague	...	...	...	3,104	2,509	595	80·8 p.c.
Relapsing Fever	...	...	...	394	37	357	9·3 p.c.
Observation and other diseases	...	...	...	987	268	719	27·05 p.c.
Total				4,485	2,814	1,671	

TABLE III.—*Plague.*

Months.				Total Admis- sions.	Died within 24 hours.	Died within 48 hours.	Total Deaths.	Total Re- coveries.	Percentage of Deaths.
June	1898	...	...	18	4	4	14	4	77·7 p.c.
July	"	...	...	55	15	8	35	20	63·63 p.c.
August	"	...	...	99	25	13	64	35	64·64 p.c.
September	"	...	...	158	56	25	121	37	76·5 p.c.
October	"	...	...	108	35	17	80	28	74·07 p.c.
November	"	...	...	29	5	10	24	5	82·7 p.c.
December	"	...	...	98	47	15	84	14	85·7 p.c.
January	1899	...	...	430	129	77	345	85	80·2 p.c.
February	"	...	...	769	225	172	642	127	83·4 p.c.
March	"	...	...	893	332	142	734	159	82·1 p.c.
April	"	...	...	326	103	53	270	56	82·8 p.c.
May	"	...	...	121	25	9	96	25	79·3 p.c.
Total				3,104	1,001	545	2,509	595	

TABLE IIIA.—*Table showing the admissions of Relapsing Fever Cases.*

Months.				Total Admis- sions.	Total Deaths.	Total Recoveries.	Percentage of Deaths.
June	1898	...	...	4	.....	4	Nil.
July	"	...	...	2	1	1	50 p.c.
August	"	...	...	41	3	38	7·3 p.c.
September	"	...	...	60	3	57	5 p.c.
October	"	...	...	62	6	56	9·6 p.c.
November	"	...	...	22	.....	22	Nil.
December	"	...	...	38	3	35	7·7 p.c.
January	1899	...	...	55	2	53	3·6 p.c.
February	"	...	...	33	6	27	1·8 p.c.
March	"	...	...	33	4	29	1·2 p.c.
April	"	...	...	28	5	23	1·7 p.c.
May	"	...	...	16	4	12	2·5 p.c.
Total				394	37	357	

TABLE IV.—*Hindoos.*

Total Admissions.				Deaths.	Recoveries.	Percentage of Deaths.
Male	...	...	...	2,721	1,914	80·3
Female	...	...	...	1,102	606	55·04
Children (under 12 years)	...	...	...	662	294	44·4
Total 4,485				2,814	1,671	62·7

TABLE V.—*Table showing the Mortality for the Year amongst Sexes and Children of Plague.*

Total Mortality for the year.	Mortality amongst the Men.	Mortality amongst the Women.	Mortality amongst Children, all under 12 years of age.
2,509	1,703	542	264

TABLE VA.

*Table showing the Mortality for the Year amongst Sexes and Children from all Causes.*

Total Mortality for the year.	Mortality amongst the Men.	Mortality amongst the Women.	Mortality amongst Children, all under 12 years of age.
2,814	1,914	606	294

TABLE VI.—*Table showing the situation of Buboes.*

Situation.	Total No. of Cases.	Males.	Females.	Mortality	Recoveries.	Percentage of Mortality.
Cervical ...	147	120	27	35	112	76.0 per cent.
Parotid ...	69	51	18	57	12	82.6 "
Right Axillary ...	252	180	72	209	43	82.9 "
Left Axillary ...	247	172	75	206	41	83.4 "
Right Femoral ...	440	347	93	335	105	76.1 "
Left Femoral ...	421	319	102	330	91	78.3 "
Right Inguinal ...	169	132	37	130	39	76.9 "
Left Inguinal ...	160	127	33	128	32	80.0 "
Other Situations *	29	22	7	16	13	55.1 "
No buboes ...	686	580	106	653	33	95.1 "
Multiple buboes	224	113	111	159	65	70.9 "
Total ...	2,844	2,163	681	2,258	586	
*Supra-trochlear ...	9	7	2	4	5	44.4 per cent.
Sub-lingual ...	1	1	...	1	.....	100.0 "
Maxillary ...	3	3	...	3	.....	100.0 "
Popliteal ...	2	2	...	.....	2	.....
Sub-clavicular ...	2	2	...	2	.....	100.0 per cent.
Iliac ...	1	.....	1	.....	1	.....
Arm ...	6	3	3	5	1	83.3 per cent.
Mammary ...	2	1	1	1	1	50.0 "
Hepatic ...	1	1	...	1	.....	100.0 "
Back ...	2	2	...	2	.....	100.0 "
Total ...	29	22	7	19	10	

TABLE VII.—*Table showing Pneumonic Plague (without Buboes).*

	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ...	181	178	3*	98.3 per cent.
Females ...	66	61	5*	92.2 "
Children ...	13	12	1*	92.3 "
Total ...	260	251	9	

\*No bacteriological examination was made in these cases, and it is doubtful whether these were cases of pure plague pneumonia.

TABLE VIII.

*Table showing Cases of Secondary Plague pneumonia (complicated with Buboes).*

	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	69	53	16	76·8 per cent.
Females .. ...	27	20	7	74·07 „
Children ... ..	2	1	2	33·3 „
Total ... ..	99	74	25	

*(Statement of the number of Hindoos of different castes admitted in the Hospital.)*

Castes.	No. admitted.	Remarks.
Marathas ... ..	3,904	
Purdesbies ... ..	128	
Lingayat Wani ... ..	72	
Brahmins ... ..	69	
Bhundary ... ..	47	
Maly ... ..	39	
Goldsmiths ... ..	38	
Somavavshi Kshatri ... ..	30	
Tailor ... ..	22	
Koli ... ..	15	
Goojarathis ... ..	12	
Barbers ... ..	12	
Dhoby ... ..	13	
Gurav ... ..	9	
Kambati ... ..	14	
Sali ... ..	9	
Agri ... ..	6	
Teli ... ..	9	
Kharvi ... ..	5	
Parbhoo ... ..	5	
Burud ... ..	1	
Jain ... ..	2	
Thakoor ... ..	1	
Marwady ... ..	1	
Coppersmith ... ..	2	
Beldor ... ..	1	
Dhangar ... ..	2	
Rajput ... ..	1	
Gosavies ... ..	4	
Kasar ... ..	4	
Kumbhar ... ..	3	
Wanjari ... ..	2	
Shenvi ... ..	1	
Lohar ... ..	3	



*Statement showing Weekly Admissions, Deaths and the Percentage of Deaths  
to Admissions.*

The total number of deaths from all causes during the year 2,814; and from plague only 2,509.

Week.	Weekly Admission.	Weekly Deaths.	Percentage to admission.
1898.			
1- 7 June ... ..	2	2	100
8-14 " ... ..	2	1	50
14-21 " ... ..	1	1	100
22-28 " ... ..	11	10	99'09
29- 5 July ... ..	5	2	40
6-12 " ... ..	14	11	78'5
13-19 " ... ..	12	9	75
20-26 " ... ..	19	11	57'8
27- 2 August ... ..	8	4	50
3- 9 " ... ..	18	12	66'66
10-16 " ... ..	20	14	70
17-23 " ... ..	24	17	70'8
24-30 " ... ..	34	26	76'4
1- 7 September ... ..	39	30	76'9
8-14 " ... ..	26	17	65'3
15-21 " ... ..	34	23	67'6
22-28 " ... ..	43	36	83'7
29- 5 October ... ..	57	38	66'66
6-12 " ... ..	40	31	77'5
13-19 " ... ..	15	14	93'3
20-26 " ... ..	7	6	85'7
27- 2 November ... ..	7	3	42'8
3- 9 " ... ..	13	13	100
10-16 " ... ..	3	1	33'33
17-23 " ... ..	2	1	50
24-30 " ... ..	7	7	100
1- 7 December ... ..	11	7	63'63
8-14 " ... ..	21	20	95'2
15-21 " ... ..	15	13	86'6
22-28 " ... ..	33	26	78'7
28-31 " ... ..	13	12	92'3
1899.			
1- 7 January ... ..	36	26	72'2
8-14 " ... ..	53	41	77'3
15-21 " ... ..	107	69	55'1
22-28 " ... ..	147	102	68'9
29- 4 February ... ..	174	149	85'6
5-11 " ... ..	165	143	86'6
12-18 " ... ..	172	141	81'9
19-25 " ... ..	201	161	80
26- 4 March ... ..	209	183	87'5
5-11 " ... ..	200	170	85
12-18 " ... ..	212	171	80'6
19-25 " ... ..	221	191	86'4
26- 1 April ... ..	186	154	82'7
2- 8 " ... ..	131	106	80'9
9-15 " ... ..	85	90	105
16-22 " ... ..	63	61	96'8
23-29 " ... ..	42	35	83'3
30- 6 May ... ..	52	40	76'9
7-13 " ... ..	48	44	91'7
14-20 " ... ..	11	14	127'2
21-27 " ... ..	10	13	130
28-31 " ... ..	14	3	21'4

The largest number of deaths on a single day was 35 on 20th March 1899.

L. B. DHARGALKER,  
*Chief Medical Officer, Mahratta Hospital.*

*Notes by the Special Medical Officer.*

The very interesting Report which Dr. Dhargalker has sent in speaks for itself and shows the very large and excellent work which has been accomplished by this Hospital, by far the largest and the most liked of all the Plague Hospitals in Bombay. The arrangements for the housing of the sick, their care and treatment were always the desired object of the Committee and the Medical Staff. The Hospital was in all respects what a Plague Hospital ought to be, *viz.*, isolated and containing all requisites for the care of the sick and the isolation of contacts. I take this opportunity of stating the gratitude I feel to Sirdar Khan Bahadur Mir Abdool Ali, Rao Bahadur Vandekar and the rest of the Committee for the great trouble they took in building wards and in looking after the sick and the staff. The Hospital was in great part built out of subscriptions collected by these gentlemen and they are models of infectious diseases wards. Dr. Dhargalker, Resident Medical Officer, Suntooji Ramji, and the rest of the staff deserve great credit for the management of the sick under most exceptionally trying circumstances, *viz.*, when every effort to alleviate and cure this most dreadfully fatal of all diseases baffled all science and failed to save only an infinitesimal proportion of cases. The Report most ably worked out by Lt. Twigg, I.M.S., on the Steam Bath Treatment I have published in full as it is most interesting, but the results are not encouraging, notwithstanding the skilful way that the method was carried out by Lt. Twigg, to whom I owe many thanks for his untiring work.

### Sunni Mohammedan Jullai Plague Hospital.

#### HISTORY OF THE FOUNDATION OF JULLAI HOSPITAL.

This Hospital was founded on the 13th April 1897 by Sirdar Oomer Jamal under the patronage of General W. F. Gatacre, late President of the Bombay Plague Committee. There was not a single Medical Officer attached to this Jullai Plague Hospital, except the Hakim in charge. A Sectional Medical Officer of the Byculla Section has kept general supervision on point of cleanliness of the wards and clothings of the patients and regular diets given. One Nurse was appointed by Liout.-Colonel James Wilkins, I.M.S., in the month of April 1899, by name Mrs. Barr. There were 7 ward boys, 3 ayahs, 1 cook, 1 assistant cook, 1 dhobi, 3 sweepers (2 male and 1 female).

#### DESCRIPTION OF THE JULLAI HOSPITAL BUILDING.

This Hospital, situated on the Ripon Road in a temporary shed, is divided into 5 wards—2 wards for male members (1 for plague and another for fever), 1 for female and 2 others for the other diseases. The new ward, which is known as DuBoulay Ward, was erected through the exertion of Lieut. Firth, late District Officer, E Ward East. It is well ventilated on all sides, and is capable of accommodating twenty patients. There is a dispensary of native drugs under the charge of the Hakim. There is one godown and one kitchen, one dead-house, quite apart from the patients' wards. During the epidemic the corpse-bearers were hired. The total accommodation is for 100 patients. There are quarters for sweepers to live and a small room used by the Nurse as an office.

#### CONSERVANCY.

There are 6 latrines—3 for male patients and 3 for females—and they are quite separate from the Hospital patients. The Bhungies are constantly kept there day and night. The night-soil of the latrines is removed to the Night-soil Depôt in iron buckets by the above Bhungies, after removing and disinfecting the excreta specially. Under no circumstances patients are allowed to use the servants' latrines, but they have to pass their motions in bed-pans on or near their beds. Proper disinfection is carried out previous to disposal. The dhobi's washing place is connected with the Municipal drains.

## WATER-SUPPLY.

It is from the Municipality water-pipe of the street.

## THE PLAGUE AMONGST THE HOSPITAL STAFF.

No plague case occurred amongst the Hospital Staff.

## THE TREATMENT.

To meet the want of a plague hospital for the Jullais or weavers situated in Byculla, this Hospital, under the management of a Hakim, was opened. The number of cases treated was nearly 600.

TABLE No. I.

Months.				Plague.	Relapsing Fever.	Observations.	Total.
June	1898	...	...	14	2	.....	16
July	"	...	...	8	4	.....	12
August	"	...	...	31	8	.....	39
September	"	...	...	39	6	.....	45
October	"	...	...	30	2	.....	32
November	"	...	...	4	3	.....	7
December	"	...	...	21	12	.....	33
January	1899	...	...	37	12	.....	49
February	"	...	...	114	25	.....	139
March	"	...	...	93	26	.....	119
April	"	..	...	55	25	.....	80
May	"	...	...	15	12	.....	27
Total				461	137	.....	598

TABLE No. II.

				Admissions.	Deaths.	Recoveries.	Percentage of Total Mortality.
Plague	...	...	...	465	210	255	
Relapsing Fever	...	...	...	133	60	73	
Observations	...	...	...	Nil	.....	... ..	
Total				598	270	328	

TABLE No. IV.

—				Total Admission.	Deaths.	Recoveries.	Percentage of Deaths.
Males	...	...	...	333	210	123	
Females	...	...	...	121	45	76	
Children	under	12	...	144	15	129	
years	...	...	...				
Total				598	270	328	

TABLE No. V.

Total Mortality for the Year.	Mortality amongst Men.	Mortality amongst Women.	Mortality amongst Children all under 12 Years of Age.
270	210	45	15



No. 5.

**General Mahomedan Hospital.  
Northbrook Gardens.**

## COMMITTEE.

*Chairman.*

Sardar Oomer Jamal, J. P.

*Members.*

Khan Bahadur Fazloollah Khan, J. P.

„ Dawoodbhoy Mussabhoy, J. P.

Sardar Kassum Metha, J. P.

Hajee Sullaman Abdul Wahid, J. P.

Khan Saheb Syed Nissar Hoosein, *Secretary.*

The list of Medical Staff of the Hospital runs as follows at present :—

Hakim T. Rahman, *Medical Officer.*Munshee Mahomed Esoof, *Compounder and General Clerk.*

Stere Clerk ...	...	...	...	...	...	...	1
Ward boys ...	...	...	...	...	...	...	2
Ayah ...	...	...	...	...	...	...	1
Cook ...	...	...	...	...	...	...	1
Dhobi ...	...	...	...	...	...	...	1
Office peon ...	...	...	...	...	...	...	1
Bhunghis ...	...	...	...	...	...	...	2

With regard to donation, so far as I am aware, I know of no donation having been made to the Hospital.

I beg to remain,

Sir,

Your most obedient Servant,

T. RAHMAN,

In charge Gl. Mahomedan Plague Hospl.

BOMBAY, 8th August 1899.

No. 2330, DATED 9TH AUGUST 1899.

TO THE SPECIAL MEDICAL OFFICER, PLAGUE OPERATIONS.

Accompanying forms from the Mahomedan General Hospital forwarded with compliments. The only donation towards the Hospital that I am aware of is that of Sardar Oomer Jamal who supplies discharged patients with clothes.

L. B. H. HAWORTH,

Acting District Officer, C Ward.

BOMBAY, 8th August 1899.

**Report on the General Mahomedan Plague Hospital,  
Northbrook Gardens, Bombay, from the 1st  
October 1898 to 31st May 1899.**

1. The records in which the history and full particulars bearing on the work and progress of the hospital were kept from 31st January 1898, on which date the hospital had been opened by Sir James Campbell, having been sent over to the

Chairman of the Committee, Sardar Oomer Jamal, it cannot be positively mentioned what were the features of the past history of the hospital. However, having a correct and systematic record since the re-establishment of the hospital, *i. e.*, from the 1st October 1898, I have been able to ascertain that this hospital was opened by His Excellency the Governor of Bombay on the above date, *i. e.*, 1st October 1898, forming a Committee of the following influential and leading native gentlemen under Sir James Campbell, to protect and develop the interest of the hospital.

COMMITTEE.

*Chairman.*

Sirdar Oomer Jamal, J.P.

*Members.*

Khan Bahadur Fazloollah Khan, J.P.

„ „ Dawoodbhoy Musabhoy, J.P.

Sirdar Kassum Metha, J.P.

Hajee Sullaman Abdul Wahid, J.P.

*Secretary.*

Khan Saheb Syed Nissar Hoosein.

*Hakim.*

T. Rahman.

And the list of Medical Staff of the Hospital runs as follows :—

T. Rahman, Hakim.

Munshi Mohamed Eusoof, Compounder and General Clerk.

One Store Clerk.

The increase shown in February 1899 in the number of ward boys and ayahs

	1898.	1899.	Now.	
Ward boys ... ..	2	5	2	
Ayahs ... ..	2	3	1	

was due to the fact that the epidemic was very high at the time and the work had, consequently, increased too much to be managed by less than the additional hands then engaged.

With regard to donation, so far as I am aware, I know of no donation having been made to the hospital, at least with the cognizance of the hospital authorities.

2. The hospital buildings themselves are of huts, strongly built of bamboo mats and jhowlees, one of which is used as Office and Dispensary. Within the hospital premises are the following wards, servants' quarters, &c., also built of the same material, *viz.*, bamboo, mats and jhowlees :—

- 1 Office and Dispensary.
- 1 Cook-room of corrugated iron sheet.
- 1 Stores.
- 2 Bhungis' huts.
- 1 Servants' quarters.
- 4 Wards distributed as—
  - 1 Male Plague Ward accommodating 20 beds.
  - 2 Female Plague Wards accommodating 20 beds in all.
  - 1 Observation Ward—half for male and half for female—accommodating 20 beds in all.
  - 1 Convalescent Shed, half for male and half for female—accommodating 12 beds in all.
  - 1 Contact Shed to take 30 persons.

3. The hospital has for its use two latrines, each containing six seats. One is for males and the other for females. They are also constructed of the same material, but with masonry seats and tin receptacles in them. They are cleaned twice daily, *viz.*, every morning and evening, the Bhangis removing the sewage in baskets.

The general practices of disinfection which we found useful, and which we follow is of the phenyle and carbolic acid solution. As hitherto, the above disinfectants have been found quite competent to answer the requirements of disinfection. I am not inclined to make any suggestion to replace them with any other.

4. We have for our hospital use nine water-pipe connections in all, which have their source from the Municipal branch main of Grant Road. Three of the nine pipes have 1" taps—one for general use and two for Dhobis—and the remainder six  $\frac{1}{2}$ " taps—three in each of the two enclosures constructed for bathing corpses, as is required by racial and religious duties.

5. Almost all the huts and wards are twice disinfected daily with the above-mentioned disinfectants, *viz.*, phenyle and carbolic acid solutions. This class of disinfectants having been found quite efficient to meet the requirements of thorough disinfection of clothes, &c., these were not sent for steam disinfection at the steam-disinfecting station.

6. The method which is adopted regarding the disposal of the dead, and which is quite consistent with the principles of customs and usages of the religion to which the deceased belonged, is the giving of bath by a professional man as soon after death as possible (in the case of paupers who have no claimants), the wrapping of the corpses in new cloth cut to the necessary size and shape, and the removing of same to the burial ground; expenses that are incurred for all these being defrayed from the fund in the hands of the District Officer who is applied to immediately at such an occasion. However, the relatives of the deceased persons make their own arrangements within the hospital premises with respect to the removal of the dead.

7. A Goanese ayah, residing within the hospital premises, was severely attacked by plague during her duties of attending upon the patients some time within the period when the hospital was originally established. The record not being available, for the reason assigned in the second paragraph of this report, I am sorry I am unable to give dates in this instance. She had two buboes—one in the right axilla and the other in the right groin. She grew unconscious and delirious within a few hours after attack, complaining of headache, and strong fever. She continued so for five days, when she gradually began to recover and ultimately was cured.

A Bhangi, also residing within the hospital premises, was attacked by plague on the 25th January 1899. A bubo appeared at the right groin. Temperature 103.4°. Complaining of headache, he became delirious; but after enduring this for two days, he began to recover, and was discharged on the 2nd February 1899.

A cook who also lives within the hospital premises was also attacked by plague on the 8th March, with a temperature of 106°. The symptoms were: tongue thickly furred, bowels costive, and unconsciousness with no bubo. This was one of the most acute cases that was admitted here. A small bubo ultimately appeared on the chest on the 12th idem; for full fifteen days his condition was bad. Afterwards he began to recover, but had a relapse. He was treated, and at length discharged, completely recovered, on the 19th April.



Afterwards a ward boy was attacked on the 31st May, with a temperature of  $105^{\circ}20$  and in a delirious condition. Bubo appeared in the left axilla ; the symptoms were general. He is recovering now.

The bubo in all the above four cases mentioned subsided.

9. The tabular statement (I) asked for under this paragraph is attached with this report.

10. The largest number of cases admitted in the week ending 1st April 1899 was 25 and on the 30th March 1899, 8.

11. The total number of deaths from all causes during the year was 166, and the largest number of deaths was 4 on the 31st March 1899.

The total weekly deaths during the year were as follows :—

Week Ending				Deaths.	Week Ending				Deaths.			
8th	October	1898	...	...	Nil.	4th	February	1899	...	...	10	
5th	"	"	...	...	Nil.	11th	"	"	...	...	12	
22nd	"	"	...	...	1	18th	"	"	...	...	5	
29th	"	"	...	...	1	26th	"	"	...	...	9	
5th	November	"	...	...	3	4th	March	"	...	...	9	
12th	"	"	...	...	2	11th	"	"	...	...	12	
19th	"	"	...	...	2	18th	"	"	...	...	10	
16th	"	"	...	...	1	25th	"	"	...	...	9	
5th	December	"	...	...	Nil.	1st	April	"	...	...	15	
10th	"	"	...	...	3	8th	"	"	...	...	6	
17th	"	"	...	...	1	15th	"	"	...	...	5	
24th	"	"	...	...	Nil.	22nd	"	"	...	...	6	
31st	"	"	...	...	2	29th	"	"	...	...	3	
7th	January	1899	...	...	Nil.	6th	May	"	...	...	9	
14th	"	"	...	...	3	13th	"	"	...	...	6	
21st	"	"	...	...	10	20th	"	"	...	...	3	
28th	"	"	...	...	6	27th	"	"	...	...	2	
						From 27th to 31st May 1899					...	Nil.
												166

The percentage of deaths to admission was about 48 per cent.

The various tabular statements asked for with this report are attached herewith as follows :—

One	statement	of	No.	I.
One	do.	do.	do.	II.
Two	do.	do.	do.	III.
Four	do.	do.	do.	IV.
One	do.	do.	do.	V.
One	do.	do.	do.	VI.
One	do.	do.	do.	VII.
One	do.	do.	do.	VIII.

Twelve in all.

Most of the observation cases particularized in Statement I turned out to be plague cases. We had no instances showing observation case developing other diseases.

T. RAHMAN,

In Charge, General Mohamedan Plague Hospital.

BOMBAY, 4th July 1899.

# Mahomedan General Hospital, Northbrook Gardens.

TABLE 1.—Total admission during the year 1898-99.

Months.	Plague.	Relapsing Fever.	Observation cases, including all General Diseases.	TOTAL.
1	2	3	4	5
1898.				
October ... ..	3	1	4	8
November ... ..	5	4	4	13
December ... ..	9	...	6	15
1899.				
January ... ..	46	2	7	55
February ... ..	67	...	3	70
March ... ..	81	...	3	84
April ... ..	55	...	2	57
May ... ..	38	...	3	41
Total ...	304	7	32	343

The cases given under column No. 4 also include, among general diseases pneumonic cases, of which a separate statement has also been appended.

T. RAHMAN,

In Charge, General Mahomedan Plague Hospital.

BOMBAY, 3rd July 1899.

TABLE No. 2.

	Admission.	Death.	Recoveries.	Percentage of Mortality.
Plague ... ..	304	156	148	51 per cent.
Relapsing Fever ... ..	7	1	6	14 „
Observation and other Diseases.	32	9	23	28 „
Total ...	343	166	177	48 per cent.

T. RAHMAN,

In Charge, General Mahomedan Plague Hospital.

BOMBAY, 3rd July 1899.

TABLE No. 3.

Months.				Admissions, Plague.	Admissions, Observation and other Diseases.	Death, Plague.	Death, Observation and other Diseases.
October	1898	...	...	3	5	1	3
November	1898	...	...	5	8	1	3
December	1898	...	...	9	6	6	1
January	1899	...	...	46	9	27	1
February	1899	...	...	67	3	40	.....
March	1899	...	...	81	3	44	2
April	1899	...	...	55	2	26	.....
May	1899	...	...	38	3	11	.....
Total				304	39	156	10

T. RAHMAN,

In Charge, General Mahomedan Plague Hospital.

BOMBAY, 8th August 1899.

The cases given under observation and other diseases also include, among other diseases, pneumonic cases, of which a separate statement has already been forwarded.

TABLE No. 3A.

Months.				Total Admissions.	Died within 24 Hours.	Died within 48 Hours.	Total Deaths.	Total Recoveries.	Percentage of Deaths.
October	1898	...	...	8	1	2	4	4	50 per cent.
November	1898	...	...	13	(a) 2	.....	4	9	31 „
December	1898	...	...	15	(a) & (b) 5	1	8	7	55 „
January	1899	...	...	55	(a) & (b) 10	2	26	29	47 „
February	1899	...	...	70	(a) & (b) 15	9	33	37	47 „
March	1899	...	...	84	(a) & (b) 14	13	51	33	61 „
April	1899	...	...	57	(b) 7	4	24	33	42 „
May	1899	...	...	41	4	5	16	25	39 „
Total				343	58	36	166	177	48 per cent.

(a) Cases admitted dead in ambulance.

(b) Most of these cases died within two and three hours.

T. RAHMAN,

In Charge, General Mahomedan Plague Hospital.

BOMBAY, July 1899.



TABLE NO. 4.—*Table showing Cases of Relapsing Fever.*

Months.	Total Admissions.	Total Deaths.	Total Recoveries.	Percentage of Deaths.
October 1898 ... ..	1	Nil	1	.....
November 1898 ... ..	4	1	3	25 per cent.
December 1898 ... ..	Nil	Nil	Nil	.....
January 1899 ... ..	2	Nil	2	.....
February 1899 ... ..	Nil	Nil	Nil	.....
March 1899 ... ..	Nil	Nil	Nil	.....
April 1899 ... ..	Nil	Nil	Nil	.....
May 1899 ... ..	Nil	Nil	Nil	.....
Total ...	7	1	6	14 per cent.

T. RAHMAN,

In Charge, General Mahomedan Plague Hospital.

BOMBAY, 3rd July 1899.

TABLE NO. 4A.

Total Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
343	166	177	48 per cent.

T. RAHMAN,

In Charge, General Mahomedan Plague Hospital.

BOMBAY, 3rd July 1899.

TABLE NO. 4B.—*Table showing Admission of Christians.*

	Total Admission.	Deaths.	Recoveries.	Percentage of Deaths.
Male ... ..	...	...	...	.....
Female ... ..	1	...	1	.....
Children (under 12 years) ...	...	...	...	.....
Total ...	1	...	1	.....

TABLE NO. 4 C.—*Table showing Admission of Hindu (Kumbhars).*

	Total Admissions.	Deaths.	Recoveries.	Percentage of Deaths.
Male ... ..	1	1	...	.....
Female ... ..	...	...	...	.....
Children (under 12 years) ...	1	1	...	.....
Total ...	2	2	Nil	.....

TABLE NO. 4 D.—*Table showing Admission of Hindu (Bhunghi).*

	Total Admissions.	Deaths.	Recoveries.	Percentage of Deaths.
Male ... ..	1	...	1	.....
Female ... ..	...	...	...	.....
Children (under 12 years) ...	...	...	...	.....
Total ...	1	Nil.	1	.....

T. RAHMAN,

In Charge, General Mahomedan Plague Hospital.

BOMBAY, 3rd July 1899.

TABLE NO. 5.—*Table showing the Mortality for the year amongst Sexes and Children.*

Total Mortality for the Year.	Mortality amongst Men.	Mortality amongst Women.	Mortality amongst Children all under 12 Years of Age.
166	112	32	22

T. RAHMAN,

In Charge, General Mahomedan Plague Hospital.

BOMBAY, 3rd July 1899.

TABLE NO. 6.—*Table showing the Situation of Buboes.*

Situation.	Total No. of Cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of Mortality.
Cervical ... ..	31	23	8	16	15	51 per cent.
Parotid ... ..	Nil	Nil	Nil	Nil	Nil	.....
R. Axillary ... ..	26	20	6	14	12	54 per cent.
L. Axillary ... ..	23	14	9	16	7	69 „
R. Femoral ... ..	Nil	Nil	Nil	Nil	Nil	.....
L. Femoral ... ..	Nil	Nil	Nil	Nil	Nil	.....
R. Inguinal ... ..	113	84	29	55	58	48 per cent.
L. Inguinal ... ..	93	68	25	46	47	49 „
* Other situation ... ..	3	1	2	2	1	67 „
No Buboes ... ..	Nil	Nil	Nil	Nil	Nil	.....
Multiple Buboes ... ..	15	12	3	7	8	46 per cent.
Total ... ..	304	222	82	156	148	51 per cent.

\* Two buboes under the jaws ; one bubo on the right hand.

T. RAHMAN,

BOMBAY, 3rd July 1899. In Charge, General Mahomedan Plague Hospital.

TABLE 7.—*Table showing Pneumonic Plague (without Buboes).*

	Admitted.	Died.	Recoveries.	Percentage of Mortality.
Males ... ..	1	1	Nil	.....
Females ... ..	2	1	1	50 per cent.
Children ... ..	Nil	.....	.....	.....
Total ... ..	3	2	1	67 per cent.

T. RAHMAN,

BOMBAY, July 1899. In Charge, General Mahomedan Plague Hospital.

TABLE 8.

*Table showing Cases of Secondary Plague Pneumonia (complicated with Buboes).*

	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	5	4	1	80 per cent.
Females ... ..	2	2	Nil	.....
Children ... ..	1	1	Nil	.....
Total ... ..	8	7	1	87 per cent.

T. RAHMAN,

BOMBAY, July 1899. In Charge, General Mahomedan Plague Hospital.



## Parsi Fever Hospital, Parel, Bombay.

*Report with a few Particulars, including History, and Management, from*

*1st June 1898 to 31st May 1899.*

### *History.*

This Hospital was founded, on 18th December 1896, by the late Dr. K. N. Bahadurji, in conjunction with the present Chief Medical Officer, Dr. K. M. Hiramaneck, and others, and the Trustees of the Parsi Punchayet took upon themselves the responsibility of starting funds and of collecting subscriptions from the community for the maintenance of the Hospital.

### *Names of the members of the Hospital Committee.*

Sir Jamsetji Jejeebhoy, Bart.  
 Sir Dinshaw M. Petit, Bart.  
 Navrozji N. Wadia, Esq., C.I.E.  
 Hormusji Edulji Allbless, Esq.  
 Jamsetji Cursetji Jamsetji, Esq.  
 Khan Bahadur Darasha R. Chichgar.  
 Jejeebhoy Framji Petit, Esq.  
 Sir Jehangir Cowasji Jehangir, Kt.  
 Ratanji Bomonji Dubash, Esq.  
 Jehangir B. Murzban, Esq.  
 Jeevanji J. Modi, Esq., B.A., Secretary.

### *The Hospital Staff.*

Dr. K. M. Hiramaneck, L.M.&S., Chief Physician.  
 Dr. D. R. Tata, L.M.&S., House-Surgeon.  
 Dr. N. K. Arjani, B.A., L.M.&S., Extra House-Surgeon.  
 Mr. D. R. Gilder, Assistant House-Surgeon.  
 Mr. Framji E. Daruvala, Manager.  
 Mr. Merwanji J. Udwardia, Assistant Manager.  
 Mr. E. F. Coelho, Hospital Assistant.  
 Mr. L. V. Godinho, Compounder.

### *Nurses.*

Miss M. McFerran.  
 Miss Ashabai N. Tolang.  
 Miss Aimai Commissariatwala.  
 Miss Banubai Khambatta.  
 Mrs. Navajbai Vachha.  
 Mrs. Smith.  
 Mrs. Lowden.  
 Mrs. Sampson.  
 Mrs. Roberts.

16 Ward-boys.

14 Ayahs.

1 Cook, 1 cook's mate, 1 cooly.

### *Description of the Hospital Buildings.*

This Hospital is situated, next to the Victoria Technical Institute, in the capacious bungalow of Messrs. Hormusji and Merwanji Muncherji Cama. It is a well ventilated and commodious bungalow, with a spacious hall, six wards on the ground-floor

used for acute cases, two wards on the first storey for convalescent patients, and, besides these, two sheds capable of accommodating more than thirty patients. There is a well-fitted dispensary, a store-room, a House-Surgeon's Office, and a Manager's Office fitted with a telephone; also a large godown and a cooks' store-room. There is a large well-ventilated kitchen and a similar stable, where an ambulance fitted with a stretcher for bringing patients to the Hospital and an ambulance for removing the dead to the Towers of Silence are kept. During the epidemic, the corpse-bearers are also kept on the premises. Above the stable there are also big quarters for the servants.

The total number of patients that can be accommodated at a time is about 100. There are also quarters for the House-Surgeons and the Nurses in the same premises.

#### *Conservancy.*

There are ten latrines attached to the building.

These latrines are kept apart from the wards, and Bhanghis are kept constantly on duty day and night, and the night-soil is removed by them to an iron cart, kept about 150 yards from the Hospital building, with due precaution for disinfection and destroying the virulence of the excreta of patients especially. Under no circumstances are patients permitted to use the latrines used by the staff. They have to pass their motions in bed-pans on or near their beds, and proper disinfection is carried out previous to disposal. The sewage goes to the Municipal drains attached to the bungalow.

#### *Disinfection of Clothes.*

The clothes are all disinfected in a strong solution of phenyle or iodine, and then washed with boiling solution of washing soda, and thoroughly exposed to the sun before being delivered to the Dhobhi. The things that cannot be washed, *e.g.*, much soiled garments, bandages, surgical dressings, napkins, draw-sheets, &c., &c., are burnt at once.

The water-supply of the Hospital is derived from the Municipal pipes,

#### *Disinfection of Wards, &c., &c.*

When a case is found in a very critical condition, the patient is at once removed to one of the special wards (called the " Danger Ward ") where deaths usually take place. Under all circumstances, all the clothing belonging to these cases is burnt, and the floor and walls are covered with unslaked lime powder, and lime-washed, respectively; and a " siggree " is kept burning on the spot for several hours, and the windows of the room are kept open day and night.

The Hospital is cleansed thoroughly twice a day, and every week it is washed, and lime-washed every month, and kept open to the sun and air before the wards are utilized again for patients.

For disinfection of the premises, thorough cleansing with washing-soda solution and plenty of lime-sprinkling on the floor is relied upon always.

For clothing, the disinfectant used is a strong solution of phenyle and iodine solution.

For cleaning hands and for surgical dressings iodine solution is also freely used, and in some cases carbolic acid solution, 1 in 40 in strength.

There is no steam disinfecter attached to this Hospital.

#### *Disposal of the Dead.*

The dead patient is immediately removed to a special room kept for the purpose, and the special ambulance is quickly ordered to be in readiness, and within ten minutes after death the body is removed in the carriage to the Towers of Silence,

The mortuary room is kept quite clean and dry. After the dead body has been for a few minutes in the mortuary a "siggree" is kept burning there constantly.

In very rare instances, in cases of detention, the dead body is kept for an hour or two in the mortuary. In such cases the usual methods of sweeping, lime-washing, and lime-sprinkling are practised, together with a thorough disinfection of the place.

This mortuary is a large room in the premises, kept clean, with absolutely nothing in it, except the "siggree."

*Plague among the Hospital Staff.*

Ten members of the Hospital Staff were attacked with plague in February 1899, of whom six died; they were all from the servant class, residing in their special quarters which are to the right, and about thirty yards apart from the main building of the Hospital. This residence has on its rear a large Municipal drain, a big pond on the right, and a well to the left; below these quarters is the stable of the Hospital. Previous to these attacks, dead rats were found in these quarters; and, consequently, the place had to be afterwards thoroughly disinfected, and the residents segregated into huts specially erected in the open part of the compound to the north of the main building.

TABLE I.—*Total Admissions\* during the year ending 31st May 1899.*

Period.	Plague Cases.	Observation Cases.	Total.
12 Months ending 31st May 1899 ...	326	81	407

\* The number of patients remaining under treatment in the Hospital on the 1st June 1898 was 11.

The largest number of admissions was 27 in the week from the 23rd March to 29th March 1899, eight patients were admitted on the 28th March 1899.

The total number of deaths during the year was 180, of which 177 were due to plague. There being 117 deaths from plague and 326 plague admissions, the plague mortality of this Hospital for the year was 54·3 per cent. The largest number of deaths, on any particular day, was five on 3rd March 1899.

TABLE II.

Disease.	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague ... ..	326	177	149	54·3
Relapsing Fever ... ..	Nil	Nil	Nil	Nil
Observation and other Diseases ...	81	3	78	3·7
Total ...	407	180	227	44·2



TABLE III.—*Classification of Deaths from All Causes.*

Months.			Total Admissions.	Deaths within 24 Hours.	Deaths within 48 Hours.	Total Deaths.	Total Recoveries.	Percentage of Deaths.
June	1898	...	6	1	0	3	9	50
July	"	...	7	2	1	4	4	57·1
August	"	...	11	2	0	4	4	36·3
September	"	...	20	0	1	2	11	10
October	"	...	8	1	0	1	15	12·5
November	"	...	5	1	0	1	3	20
December	"	...	50	3	1	21	16	42
January	1899	...	55	5	14	26	27	47·2
February	"	...	68	11	10	30	20	44·1
March	"	...	73	13	9	42	29	57·5
April	"	...	73	8	4	32	35	43·8
May	"	...	31	1	7	14	36	45·1

TABLE IIIA.—*Classification of Plague Deaths.*

Months.			Total Plague Admissions.	Plague Deaths with- in 24 Hours.	Plague Deaths with- in 48 Hours.	Total Plague Deaths.	Total Plague Recoveries.	Percentage of Plague Deaths.
June	1898	...	5	0	0	1	5	20
July	"	...	7	2	1	4	4	57·1
August	"	...	7	2	0	3	5	42·8
September	"	...	6	0	1	2	2	33·3
October	"	...	2	0	1	1	3	50
November	"	...	3	1	0	1	1	33·3
December	"	...	35	3	1	21	4	60
January	1899	...	45	5	14	26	14	57·7
February	"	...	64	11	10	30	17	46·8
March	"	...	65	13	9	42	22	63·8
April	"	...	63	8	4	32	28	50·7
May	"	...	24	1	7	14	26	58·3

TABLE IV.

Total Admissions.		Deaths.	Recoveries.	Percentage of Deaths.
Males of and above 12 years.	205	93	112	45·3
Females of and above 12 years.	146	72	74	49·3
Children under 12 years.	56	15	41	26·8

*N.B.*—Parsis only are admitted into this Hospital.

TABLE V.

Total Mortality of the Year.	The Mortality among Males of and above 12 Years.	The Mortality among Females of and above 12 Years of Age.	Mortality among Children under 12 Years of Age.	Mortality among Persons of All Years of Age.
180	93	72	15	180
	<i>i.e.</i> , 45·3 per cent.	<i>i.e.</i> , 49·3 per cent.	<i>i.e.</i> , 26·8 per cent.	<i>i.e.</i> , 44·2 per cent.

TABLE VI.—*Showing the Situation of Buboes.*

Names of Buboes according to their Situations, &c., &c.			Total number of Cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of Mortality.
Cervical	...	...	19	14	5	12	7	63·6
Parotid	...	...	6	2	4	2	4	33·3
Right Axillary	...	...	24	9	15	14	10	58·3
Left Axillary	...	...	16	11	5	8	8	50
Right Femoral	...	...	76	42	34	39	37	51·3
Left Femoral	...	...	55	29	26	35	20	63·6
Right Inguinal	...	...	75	42	33	39	36	52
Left Inguinal	...	...	77	44	33	44	33	57·1
Mesenteric	...	...	13	9	4	5	8	38·4
Supra Trochlear	...	...	2	2	0	0	2	0
Popliteal	...	...	3	1	2	0	3	0
Intercostal	...	...	1	0	1	0	1	0
Sub-maxillary	...	...	4	2	2	1	3	25
Multiple Buboes	...	...	73	44	29	41	32	56·1
No Buboes	...	...	38	20	18	23	15	60·5

TABLE VII.—*Showing Pneumonic Plague without Buboes.*

							Admitted.	Died.	Recovered.	Percentage of Mortality.
Males	...	...	...	...	...	...	1	1	0	100
Females	...	...	...	...	...	...	4	4	0	100
Children	...	...	...	...	...	...	1	0	1	0

The physical signs present in the cases of pneumonic plague were as in the annexed charts:—

Dullness of both the lungs, more especially at the base; tubular breathing with a few rales scattered all over in the bronchial tubes; incessant cough with quick breathing (Cheyne-Stokes in character), with a peculiar choking sensation; expectoration, tinged with blood more or less sero-mucoid in character; hæmorrhage, at times of a few ounces of dark, red blood; and well-marked cyanosis before death.

No such cases were subjected to a bacteriological examination.

TABLE VIII.

*Showing cases of Secondary Plague-Pneumonia complicated with Buboes.*

		Admitted.	Died.	Recovered.	Percentage of Deaths.
Males	...	Nil.	Nil.	Nil.	Nil.
Females	...				
Children	...				

### Notes on the Symptoms, Character and Treatment of the Disease.

From personal experience at the hospital, it has been found that the period of *Incubation* varies from a day to a week. (Certain patients having been segregated, went for a single night to sleep in infected houses and caught the disease.)

#### *Symptoms.*

Among the external and most prominent symptoms of plague are a visible expression of complete prostration, an anxious and pinched expression of the face with a peculiar 'risus sardonius' over it, and the appearance of buboes on the surface of the body. This enlargement of the glands may be either a mere tenderness without swelling, or a huge tumour. Injected blood-shot eyes form another external symptom of the disease, but this symptom is generally accompanied with several others affecting as well the circulatory system of the human body. The pulse is in all cases frequent and soft, but in acute cases even irregular and intermittent from the very onset; and the circulatory system in acute cases is even so far damaged as to bring on a marked lividity of the countenance, or a general cyanosis of the whole body or, in cases of abnormal distension of the portal venous system, grumous vomiting; there are likewise hæmorrhagic petechial or blackish patches on the body as well as the extremities due to failing circulation. The mischief wrought by plague on the respiratory system is, however, not less remarkable than on the circulatory one; the breathing, which is from the very onset of the attack, frequent and shallow, soon turns dyspnœal with the development of the disease, and this difficulty of breathing is more commonly inspiratory than expiratory. Dyspnœal breathing is always an essential symptom of extreme cases except when it originates in the mere distension of the abdomen so common in plague. But by far the most alarming symptom of the damage done by plague to the system is the vomiting of blood. By the time, however, the plague presents such alarming symptoms, the nervous system is entirely shattered. Purely nervous affections commence either with a marked stupor or a restless and sleepless condition accompanied with severe headache; and these symptoms gradually give place to coma, or delirium (either low muttering or violent) or hyperpyrexia according to the precise character of the plague development. The last symptom hyperpyrexia is invariably accompanied with intense thirst. Turning next to the effects of plague on the alimentary system, we must note a dry and brown-furred tongue, occasional retching and vomiting, abdominal distension with a stubborn constipation consequent upon it, or even, as in certain cases, diarrhœa as its commonest symptom, whilst the only affection common to the urinary organs in plague is the retention of urine, with Hæmaturia in rare instances.

Malaria and Bronchitis have been observed to complicate plague cases; but no such complications have been known to accompany the disease after the patients have been brought to the hospital, because of their summary prevention: likewise there have been no sequælae marked after recovery in this hospital. The period of convalescence is from three to nine weeks. Eighty-one cases were kept under observation, and nearly all of them were found to be simple fever cases, and only three were those of Phthisis. Mumps have never been mistaken for plague in this Hospital.



*Treatment.*

The patient is brought to the hospital in the special ambulance (rubber tyred) on a stretcher, and removed carefully in the horizontal position. The greatest care is taken that the patient does not sit up. The House Surgeon on duty attends to the case previous to admission in the wards and takes notes of the condition on admission. The patient is removed to the ward on a stretcher, and under the personal supervision of the nurse, is lifted on to his bed which has been kept ready-prepared. On the cot is placed a mattress of cotton and over it a mackintosh of the full length of the bed, and over it a white blanket and draw-sheet, and a small piece of mackintosh over the draw-sheet. A pillow stuffed with cotton is placed under the head, protected by a mackintosh and a towel over the latter. The nurse removes the home-clothes, which are handed over to the Manager (who burns them) and sponges and thoroughly cleans the patient laid over a mackintosh of the full length of the bed with soap and hot-water with some disinfectant, and clothes him with a "sudra," a "lenga" and flannel shirt.

*Professional Treatment.*

A large enema of warm-water (or ice-cold water if Temperature be high) is immediately administered (unless the bowels have been thoroughly moved at home) and an ice-bag is placed on the head, and vinegar lotion and ice-bag are placed on the bubo. If there be Tympanitis, another large ice-bag is placed on the stomach, and Tr., Assafoetida and Turpentine mixed in equal quantities are rubbed on the abdomen, as well as the Tympanitis Enema (containing Tr., Lavand. Co., T., Assafoetida, Ol. Ricini, &c.) administered always with good results. The rectal tube is also inserted and kept for 15 to 30 minutes in case of spasmodic contraction of the lower end of the gut. Cold douche of iced water is poured on the head for 10 to 15 minutes, and if the temperature keeps up, it is repeated every two hours. This is also done if the patient be restless or delirious or violent. If violent, the patient is tied to the bed with a tape which runs across the chest and other measures are taken to prevent the patient from sitting up. Bromide of Potash is only administered in special cases and in small doses of 3 or 5 grains, if the patient is very noisy or violent, provided the pulse is not weak. A special chart is kept for every individual patient, where full particulars of his temperature, pulse, respiration, &c., &c., are daily marked morning and evening, and in very bad cases even every two hours. No food is given to acute cases except a cupful of arrowroot congee with 3 ii of Brandy every three hours, and no milk unless they commence to improve, when fresh milk (a cupful) is given morning and evening.

In all cases with a Temperature above 99°, the patient is kept in a half-pack which is removed and wetted every two or three hours as it gets dry.

If the Temperature be above 103°, ice-cold pack is wrapped round the whole body, with separate pieces for the arms and legs. The half-pack is kept constantly on and removed only when the Temperature remains normal for several days and the patient is quite convalescent.

*Medicinal Treatment of Plague.*

Stimulant mixture ʒ i (consisting of Spt., Ammon. Aromat, Liq. Strychnia and Brandy) is given every three hours and Strychnia-Brandy mixture is given in dram doses every hour, or in very bad cases in half dram doses every half hour. If there be any rigidity of the limbs, Strychnia is omitted entirely from both the mixtures and Tr. Belladonna in minim doses is given every hour. In cases with a small pulse special Strychnia and Brandy mixture (containing ether) is given every half-hour in minim doses. In cases of high breathing, Belladonna Tincture is pushed on in small hourly doses, and in bad cases of this type, Liq. Atropine m.i. is injected occasionally, if the pulse-condition allows.

When swallowing is difficult and the patient refuses everything by the mouth the mixtures and feeding are given per rectum every three hours in double doses, or nasal feeding is resorted to.

Hypodermic medication is resorted to in all true plague-cases and m. ii. of Liq. Strychnia, and m. x. of ether are injected regularly every four hours, day and night, with due precaution for rigidity of the muscles and high temperatures. In serious cases the above is repeated every two hours with minim doses of Liq. Strychnia.

#### *Treatment of Complications.*

Delirium is combated with ice-cold douching every two or three hours and occasionally Bromide is given guardedly by the mouth or per rectum. In sleeplessness half a dose of the sleeping-draught containing a little Bromide and Brandy is administered and repeated if necessary; but in the majority of cases, a simple ice-cold douche on the head for about 10 minutes proves equally serviceable. In hyperpyrexia the patient is wrapped in a full pack of iced-sheets and the same cold treatment resorted to in delirium is given to the patient. In very extreme cases, however, ice-rubbing on the spine and on the nape of the neck is indispensable. In bad cases suffering from Hiccough an extra ice bag is resorted to on the pit of the stomach, and anything tending to increase the spasmodic contraction is omitted; a minim dose of Belladonna along with a little Ether or Brandy is pushed on every hour. When a patient is found in a very low condition, the external application of dry heat to the extremities and sinapism on the chest and diffusible stimulants are freely administered; the two-hourly hypodermic injections of Ether and Strychnia are persevered in.

Vomiting in milder cases necessitates the placing of an ice-bag on the epigastrium, and the total suspension of all food by the mouth except a little ice-cold congee, sometimes a little subnitrate of Bismuth is mixed with Bicarbonate of Soda and given; whilst Salol too is at times not less useful. In persistent cases Ammonia and Ether are entirely omitted from the mixtures and Mist. Pepsine Co., (Hewlett's) given instead with due caution. The same preparation is also very useful in severe cases of Diarrhoea, provided the pulse-condition of the patient in either case allows the free use of it, and in such cases of Diarrhoea also, Bismuth and Salol is given either by the mouth or per rectum as needed. Much care is also taken absolutely to suspend the administration of milk. In extreme constipation, on the other hand, a warm-water enema, with sometimes even a little Ammonium Chloride is given once a day; but when this is found to be ineffective, Glycerine and Castor-oil in dram doses are injected per rectum with a little congee. When this condition is accompanied with a considerable distension of the abdomen, Tr. Assafoetida is used for external and internal medication with great efficacy, and ice-cold compresses at the same time are placed on the abdominal wall.

Retention of urine is relieved as far as possible either by placing cold compresses on the pubes or by emptying the lower-bowel by enema, &c.; hence the catheter is resorted to only later on.

The commonest cutaneous affection is the bedsore; this is cleaned with Iodine Lotion and an ointment composed of Iodoform, Hazeline and Lanoline applied to it on lint. The abscesses that sometimes follow the hypodermic injection of Ether are dressed antiseptically or cauterized with Nitrate of Silver when necessary.

In Pneumonic-plague, the abovementioned treatment is adopted; no hot poultices or jacket-poultices are used; but ice-bags and cold are externally applied to the chest wall.



*Treatment followed in a mild case of Plague or Pestis Minor.*

In a mild attack of plague, the same treatment is carried out as in the malignant type, excepting the Hypodermic injections. The condition of the bowels, the administration of stimulant mixtures and the cold applications on the head and the bubo are carefully looked to as in the acute stage; but the patient is wrapped in a pack of iced-sheets only over the trunk of the body, and his conji-diet is speedily replaced by a milk one, which in turn soon advances to a soup-diet and lastly to a full one.

*Convalescence.*

During convalescence, the Mist. Stimulans and the pack are gradually omitted, and the ice-bag removed; the gland is opened and dressed twice a day with Iodine Lotion and freely irrigated and loose sloughs removed. If there is induration around the site of incision, Ung. Hg. and Ung. Iod. in equal parts are rubbed, or if needed, a poultice is placed on it to soften the hardness.

*Serum as a Curative Treatment.*

The curative serum of Roux was never tried in this Hospital, but two female patients, mother and daughter, by name Mrs. and Miss Bezonji Kapadia were subjected to Lustig's serum. Their charts are annexed herewith.

Mrs. Sunabai Kapadia, a Parsi female, aged 45 years, was admitted at 4 p.m. on 8th February 1899, with a temperature of  $103^{\circ}$  and pulse 140 beats, weak. The fever was of three days' duration. There was no cough nor vomiting and she had not slept at home the night previous; she was restless, but neither delirious nor violent. Her bubo was right-femoral and well-developed. The tongue was brown, but moist. The bowels had been moved freely before admission.

At home, she was, the same morning, injected with 20 c. c. of Lustig's curative serum, and at 7 p.m. on the same day, she was injected a similar dose in the Hospital.

Her condition at 7 p.m. was very grave, the tongue dry, the temperature  $102.4^{\circ}$ , the breathing shallow and hurried, and the pulse irregular and high in tension. She had moreover mitral incompetency and extreme debility. There was also distension of the abdomen. She was injected Ether m. x and Strychnia m. ii on admission and just before death. Nothing was given to her by mouth except oz. iii of Brandy with oz. ii of conji every three hours. Ice-bags were kept on the head and bubo. At 2 a.m. on the 9th, the temperature rose to  $105.4^{\circ}$ , and she was pulseless; the pupils were dilated, the extremities cold, and she was gasping for breath. She died at 2-30 a.m. on the 9th within twelve hours after admission.

Miss Maneckbai Kapadia, a Parsi girl, aged 18 years, was admitted at 2-30 p.m., on 8th February 1899, with temperature  $103.8^{\circ}$ , pulse 124—fair, and a foul tongue. There was considerable mental excitement and an inclination to weep. She was perfectly conscious and there was no delirium, she had a right inguinal bubo.

She was also injected 20 c. c. of Lustig's Serum at home in the morning and a similar dose at 7 p.m. in the Hospital. The same treatment was tried in her case for the first 24 hours as on her mother; but the temperature rose at midnight to  $106.4^{\circ}$  and she became restless and cyanosed with a feeble pulse at 2 a.m. on the 9th. At 1 p.m. on the 9th, the usual treatment of the Hospital was given to her at the request of her relations, and on the 11th her pulse was 120—fair in volume and the temperature had come down to  $100^{\circ}$ , she was rational and cheerful, and the bowels that were obstinately constipated for the first two days in spite of enemata and drugs were freely moved and there was no retention of urine.



Her bubo was opened on the 16th February 1899, and pus removed therefrom. She remained convalescent for over two months and was discharged cured of plague on 22nd April 1899.

*Special point of Interest.*—Both these ladies were inoculated in February 1898 with Haffkine's serum and on 21st January 1899 with Yersin's serum.

Notes by  
the Special  
Medical Officer.

The report on this Hospital speaks for itself. The Hospital is well-managed and has done excellent work amongst the Parsi Community.

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No. 7.

K. B. Mahomedbboy Ebrahim Hassum Bhalloo, Plague Hospital  
for Khojas.

DONTAD CROSS LANE,  
BOMBAY, 24th July 1899.

TO THE SPECIAL MEDICAL OFFICER,  
PLAGUE OPERATION,  
BOMBAY.

SIR,

I have the honor to submit herewith the report of the K. B. Mahomedbboy Ebrahim Khoja Plague Hospital, for 12 months, from the 1st of June 1898 to the 31st of May 1899.

2. The Hospital was founded by the late lamented K. B. Mahomedbboy Ebrahim on the 26th April 1897, there were no donations or contributions towards the maintenance of the Hospital, all the expenses were borne by the founder. During his life-time there was no Committee of Management, he used to look after everything in connection with the Hospital himself. During the first 3 months of the year under report, Dr. V. Dias was in charge of the hospital during the absence of the permanent incumbent, Dr. Khwaja Abdulla. Mr. Shirally Ebrahim was the Manager of the hospital throughout the year. The hospital staff consisted of the Medical Officer in charge, Dr. Khwaja Abdulla, two Nurses, Mrs. Fernandes and Miss Manzulla, two Compounders, 4 Wardboys, 4 Ayahs, 1 Hamal, 2 Cooks, 2 Ramoshis, 1 Priest and 2 Metharanis.

3. The hospital is a three-storied building, the ground floor is used for patients under observation. All the 3 stories are used for patients suffering from Plague, a part of the second story is occupied by the Office and Dispensary. A separate four-storied building just near the hospital was rented for the purpose of accommodating about 60 contacts, and also for the use of the hospital servants.

4. As regards excreta, they were mixed with strong solution of phenyle, carbolic lotion, or perchloride of mercury solution and then thrown into the latrines. The patients were not allowed to use water closets, but each patient was provided with a bed-pan. The bedding, such as mattresses, &c., were disinfected with the perchloride lotion or strong solution of phenyle, allowed to dry and then handed over to the Dhobi for washing, in majority of cases the mattresses were burnt.

5. The supply of water was drawn mainly from the service pipes of the hospital building, but the supply not being constant, we were obliged to get water from outside.

6. The floors of the wards were sprinkled every morning with strong solution of carbolic acid or mercury, and limewashed twice a week, the whole building, including the walls, windows, ceilings, &c., was disinfected twice during the year. The clothings of the patients were generally burnt either after recovery or death, and therefore there was no necessity for sending the same to the disinfecting Station.

7. As soon as a patient died, the body was covered or wrapped with a sheet saturated with a strong solution of mercury or carbolic acid, and then removed immediately to the Khoja Cemetery which is not far off. The body was not allowed to remain in the hospital for more than an hour or two. Pauper patients were also treated in the same manner and the expenses for the disposal of the body were paid by the founder of the hospital.

8. A list giving full particulars of cases inoculated with Professor Haffkine's serum is herewith attached.

9. There was no sickness amongst the staff of the hospital.

10. Attached please find eight tables, giving full particulars as regards the admissions, deaths, recoveries, situation of buboes, percentage of mortality, &c.

11. During the week ending 18th March 1899, there were 24 admissions which is the highest number admitted, 7 patients admitted in one day only, which was the 14th March last.

12. The total number of deaths during the year<sup>\*</sup> is 100, of whom 97 died of Plague; the average percentage of deaths is 50. There were 6 deaths in one day only, which was the 22nd March last.

13. *Incubation*.—The statements made by the patients and their relations are generally unreliable, and therefore it is impossible to state with accuracy the period of incubation, but from a few reliable cases which I know of, the period of incubation appears to be from a few hours to 8 or 10 days.

14. *Symptoms*.—*Fever*.—It lasts for about six days, unless there are complications. It varies from 100 to 108°, but nothing depends upon temperature as regards the prognosis, unless the temperature is above 106°. I have seen almost all patients die when the temperature rises above 106°; we had only one case recovered in January 1898, whose temperature had gone above 106°. Sudden subsidence of the fever during the first 5 days is a very dangerous sign, almost fatal.

*Pulse*.—Is always frequent and full in the beginning, its beat ranging from 100 to 106 or sometimes more; as the disease advances it becomes weak, irregular, intermittent, &c. The pulse is the only sign which I think shows whether the patient is progressing favourably or not. If the pulse is weak, notwithstanding the symptoms appearing favourable, the case generally proves fatal.

*Respirations*.—Are always increased, sometimes as far as 60 or even 80 per minute; if the respirations increase without any lung complications, it is a bad sign; sometimes the respirations become irregular.

*Tongue*.—In the beginning it becomes white, coated, with the edges red; as the case advances, it becomes dry, brownish or sometimes black in bad cases; moist and cleaner in favourable cases. The only characteristic sign of plague in its characteristic tongue.



*Bowels.*—Are generally constipated, moderate purging is always good, excessive purging is always a bad sign and specially when the stools are black in color ; all my patients who vomited black matter or who passed black stools, died.

*Urine.*—Is always high-coloured and scanty, it occasionally contains albumen, suppression of urine is always a bad sign.

*Lungs.*—The complications are either primary or secondary, such as, bronchitis, broncho-pneumonia, pneumonia, hypostatic-pneumonia ; when pneumonia is primary the prognosis is always grave, we had only one case recovering in 1898, from pneumonic plague. I have seen a mild form of bronchitis or broncho-pneumonia, precede death in a majority of fatal cases.

*Liver.*—In some cases it is enlarged and all the symptoms of acute hepatitis are present, sometimes jaundice is present ; as regards the prognosis, I do not think hepatitis is a bad sign.

*Brain.*—In almost all cases of plague, there are brain symptoms more or less present, the eyes become red, conjunctive injected, loss of sleep, and often violent delirium. Convulsions in children are often present and signs of acute meningitis are seen ; sometimes the patient becomes unconscious and remains in that state from a few hours to 5 or 6 days. I have seen patients with all these symptoms and who could not swallow a drop of medicine, recover completely. Adults and strong persons suffer more from brain symptoms (complications) than the weak and the old. We occasionally see loss of sight and paralysis in plague cases.

*Blisters.*—They are generally black in color, and are seen only at the end of an epidemic. I had several such cases under my treatment. Blisters generally appear on the extremities, they also appear on the stomach and back.

*Pregnancy.*—There is an impression that if pregnant women get plague, they generally die ; my experience is quite different. I had 4 such cases in Hospital, two of whom aborted and died, while the two others recovered ; (one was delivered of a male child and both the mother and the child were discharged cured 12 days after delivery).

*Buboes.*—They may appear either before, with or after the fever ; if the bubo appears early and the patient takes rest in bed for about a week and keeps himself on liquid diet, I think each and every such case will recover. Buboes sometimes appear very late, I have seen cases in which they appeared on the 7th day, such cases generally prove fatal. There may be more buboes than one. When there is more than one bubo the prognosis is always favourable. In the beginning there is only tenderness, it gradually increases in size ; the pain becomes intense, sometimes the pain is so severe, that even if the patient is unconscious and you press the spot, the patient will cry out. Sudden disappearance of the bubo within the first 5 days is always a bad sign. The bubo may be as small as a pea or it may be as large as a mango. I have seen a patient, the circumference of whose bubo was 12 inches, it was very painful and the patient was so restless that I had to cut it open in several places to relieve pain, he ultimately recovered, his name is Mahomed Jaffer Anand, he was admitted on the 18th January and discharged as cured on the 22nd March last ; about 5 days after the operation, the gland came out. Buboes on both sides of the neck with pneumonia is a fatal sign. Buboes in the axillary regions are most fatal. In the majority of cases the buboes suppurated.

#### *Treatment.*

*Diet* :—Milk only to be given, occasionally Brand's Essence of Chicken and Coffee.



Absolute rest to both mind and body. If the bowels are constipated, I give an enema of soap and water. In children I prescribe Santonine with a few grains of Calomel. If the patient cannot swallow anything, I generally give milk and medicine by enemata. To relieve thirst soda water is given freely. I do not recommend the use of ice. If the temperature is high, I apply ice to the head; if the temperature is not very high, I cause Eau de Cologne or rose water to be applied to the head. Mustard foot-bath is also given. Goat's milk is rubbed on the hands and feet when the temperature is high and brain symptoms present. In old and weak persons, if the temperature is not very high, I do not apply anything to the head.

*Application to the bubo*:—If the bubo is small, I apply poultice; if it is large, I apply an ointment of Plarbitis til seeds with vinegar, and when the acute symptoms have subsided Belladonna and Mercurial ointment, and finally if the bubo shows sign of suppuration, I apply poultices and open it like an ordinary abscess under strict antiseptic precautions. If the bubo is very large and the pain is so intense as to give me cause to apprehend that it alone will kill the patient, I open the bubo. Whenever the bubo is situated in places where there are loose tissues, I apply leeches.

*Medicinal treatment*.—If the temperature is not very high and if there are no complications, I give my decoction which I continue up to the time of convalescence, and even during convalescence, I continue the same till the patient is discharged. If there are lung complications, I give two mixtures alternately, (my decoction and stimulants) with poultice to the chest and back, ice to the head, &c. When there is diarrhoea, I do not give my decoction but depend for a time on Hewlett's Pepsin Mixture with stimulants, and when the diarrhoea has ceased, I continue either my decoction or stimulants according to the symptoms present, if the pulse is failing I give a subcutaneous injection of Ether, Digitalis and Strychnia.

*Lustig's Serum*:—Two cases were treated by Dr. Gallote by Lustig's Serum, both proved fatal.

I have the honour to be,

Sir,

Your most obedient servant,

KHAJHA ABDULLAH, L.M.S.,

*Medical Officer in charge.*

Notes by the  
Special Medical  
Officer.

This Hospital is situated in a densely crowded locality and the surroundings are very insanitary. I must say that I think that the place is badly situated for treatment of plague cases. Nevertheless the Hospital was thoroughly well looked after and the Khojah Community have brought their sick to Hospital having great faith in the kind way in which they were attended to by Dr. Khajha Abdullah, the Medical Officer. The Khojah Community has suffered an incalculable loss in the death of the founder and maintainer of this Hospital, Khan Bahadur Mahomed-bhoy Ebrahim. I frequently visited this Hospital and was always interested in the cases which I found there.

TABLE NO. I.—*Total Admissions during the year.*

Months.	Plague.	Relapsing Fever.	Observation Cases.	Total.
1898.				
June...	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>
July ...	3	<i>Nil.</i>	<i>Nil.</i>	3
August ...	16	<i>Nil.</i>	1	17
September ...	19	<i>Nil.</i>	2	21
October ...	4	<i>Nil.</i>	2	6
November ...	3	<i>Nil.</i>	1	4
December ..	7	<i>Nil.</i>	1	8
1899.				
January ...	15	<i>Nil.</i>	2	17
February ...	33	<i>Nil.</i>	<i>Nil.</i>	33
March ...	54	<i>Nil.</i>	8	62
April ...	16	<i>Nil.</i>	1	17
May ...	11	<i>Nil.</i>	<i>Nil.</i>	11
Total ...	181	<i>Nil.</i>	18	199

TABLE NO. II.

	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague ...	181	97	84	53
Relapsing Fever ...	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>
Observations and other Dis- eases ...	18	3	15	16
Total ...	199	100	99	50

TABLE NO. III.

Months.	Total Admissions.	Died within 24 hours.	Died within 48 hours.	Total deaths.	Total Recoveries.	Percentage of deaths.
1898.						
June ...	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>
July... ..	3	<i>Nil.</i>	<i>Nil.</i>	1	2	33
August ...	16	6	3	10	6	62
September ...	19	5	4	12	7	63
October ...	4	1	<i>Nil.</i>	1	3	25
November ...	3	<i>Nil.</i>	1	2	1	66
December ...	7	1	1	2	5	28
1899.						
January ...	15	2	2	5	10	33
February ...	33	9	2	17	16	51
March ...	54	11	7	33	21	61
April ...	16	1	2	5	11	31
May... ..	11	3	2	9	2	81*
Total ...	181	39	24	97	84	

\* Two were isolated at home and when they were dying sent to Hospital. Three were treated at home for several days and when worse sent to Hospital, and two were brought from up-country in bullock carts.

TABLE No. IV.

	Total ad- missions.	Deaths.	Recoveries.	Percentage of Deaths.
Males ... ..	79	51	28	64
Females ... ..	61	29	32	47
Children under 12 years	41	17	24	41

TABLE No. V.—*Showing the mortality for the year amongst sexes and children.*

Total mortality for the year.	Mortality amongst the men.	Mortality amongst women.	Mortality amongst children all under 12 years of age.
97	51	29	17

TABLE No. VI.—*Showing the Situation of Buboes.*

Situation.	Total No. of cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of mortality.
Cervical ... ..	14	4	10	3	11	21
R. Axillary ... ..	12	6	6	9	3	75
C. Axillary ... ..	18	9	9	10	8	55
R. Femoral ... ..	1	...	1	1	...	100
L. Femoral ... ..	1	...	1	...	1	<i>Nil.</i>
L. Inguinal ... ..	60	37	23	35	25	58
R. Inguinal ... ..	59	27	32	34	25	57
Other Situations ..	2	1	1	1	1	50
No Buboes ... ..	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>
Multiple Buboes ...	14	9	5	4	10	28

TABLE No. VII.—*Table showing Pneumonic Plague (without Buboes).*

	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>
Females ... ..	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>
Children ... ..	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>

TABLE No. VIII.

*Table showing cases of Secondary Plague Pneumonic (Complicated with Buboes).*

	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	15	7	8	46·66
Females ... ..	6	1	5	16·66
Children ... ..	5	0	5	<i>Nil.</i>



## Report on the Stuart Strong Plague Hospital at Colaba from the 1st December 1898 to the 31st May 1899.

No. 8.

The idea to erect a temporary Plague Hospital for the benefit of the inhabitants of Colaba, who for the greater part are poor mill operatives, cartmen, and domestic servants, emanated from Khan Saheb Mahomed Faridudin, whose intimate knowledge of local conditions, and close touch with the various communities at Colaba, had forced upon him the conclusion, that the only means to instil entire confidence into the then terror-stricken minds of the people would be the erection of a hospital, thrown open to all creeds, castes, and conditions of people, a hospital, in which a patient could be attended by his own kith and kin, and where his caste prejudice would not be interfered with.

On his initiative the Colaba volunteers formed themselves into a Committee on the 2nd October 1898, and were able to admit the first patient into the hospital on the 5th December 1898.

The opening ceremony was performed by His Excellency the Governor on the 23rd December 1898, who at the desire of the Committee named the hospital after the then District Officer, Lt. H. S. Strong, the Stuart Strong Hospital.

The following is a list of the Members of the Committee:—

K. R. Cama, Esq., J. P.....	President.
Shams-ul-Ulma J. J. Modi .....	Vice-President.
The District Officer, A Ward .....	Ex-Officio Member.
Khan Saheb Mahomed Faridudin .....	Treasurer.
Mr. C. Hummel .....	Secretary.

### Members.

Mr. Hubert Crawford.	Mr. Merwanjee Colabawala.
„ A. Rooman.	„ Sheik C. Malang.
„ Harrichandra Visram.	„ Santoo Gannujee Master.
„ G. M. Fernandes.	„ Mahomed Ibrahim.
„ Raghonath Rao B. Malap, J. P.	„ Gopal Nagu Patel.
„ Vithal Sayana.	„ Yellappa Malajee.
„ Paidal David.	„ Keshow Jadardhan Vaydia.

Mr. Dajee Narain Deshpande.

The wages of the staff (excepting those to Ramosies, which were paid by the Municipality) and part of the maintenance expenses were defrayed by public subscriptions, collected from time to time by members of the Committee, while the Municipality supplied furniture, clothing, water, medicines, disinfectants, and latterly also certain provisions used at the hospital. The warmest gratitude of the Committee is due to the District Officers, Captain Lock and Lieut. Strong, for the great interest both gentlemen have at all times taken in the welfare of the Hospital, and their constant exertions on its behalf, to which entirely is due the exceptional help that the Committee has enjoyed on the part of the Municipality.

Attached is a list of donors, who helped the Committee to carry out their work by coming forward with subscriptions in aid of the Maintenance Fund. The Committee takes this opportunity of again tendering them their hearty thanks.

At the same time, I attach a balance sheet showing, how the whole amount collected up to the 31st May, has been applied.

The following is a list of the staff of the Stuart Strong Hospital :—

NAMES.	PAY.		EMPLOYED	
	Original.	Raised to	From	To
	Ps.	Rs.		
Dr. Kutar, Medical Officer ... ..	100	...	11-12-98	31- 5-99
Mrs. A. Swinden, Head Nurse .. ..	70	80	1-12-98	31- 5-99
Vital R. Balsare, Hospital Assistant ...	30	35	1-12-98	31- 5-99
Bomanbai, Nurse ... ..	15	...	5- 2-99	30- 4-99
Sireenbai, " ... ..	25	...	12- 3-99	31- 5-99
Bhima, Ayah ... ..	10	12	1-12-98	31- 5-99
Parvati, Ayah ... ..	10	11	22- 3-99	31- 5-99
Geo. V. Caston, Clerk .. ..	20	...	6- 4-99	31- 5-99
Ambajee Baloo, Ward-boy ... ..	10	11	1-12-99	31- 5-99
Sitaram M. Ganoo, Ward-boy ... ..	10	11	1-12-98	31- 5-99
Ladoo Dehu, Ward-boy ... ..	10	11	8-12-98	31- 5-99
Pandoo Balajee, Ward-boy ... ..	10	11	12-12-98	31- 5-99
Pandoo Rama, Ward-boy ... ..	10	11	1- 3-99	31- 5-99
Luxman Ramjee, Ward-boy ... ..	10	11	9- 3-99	31- 3-99
Pandoo Rama, Mahratta, Ward-boy ...	10	11	21- 3-99	18- 4-99
Gunoo Hira, Ward-boy ... ..	10	11	1- 5-99	31- 5-99
Govind Lachman Gag, Cook ... ..	10	11	15- 1-99	31- 5-99
Panjam Gajoo, Dhobie ... ..	12	...	1-12-98	31- 5-99
Lachma Chandi, Dhobie ... ..	12	16	1- 1-99	31-12-98
Durjaa Lallu, Dhobie ... ..	4	...	23- 2-99	31- 5-99
Babu Mari, Sepoy ... ..	10	...	1-12-98	31- 5-99
Gangaram, Sepoy ... ..	10	...	22- 4-99	18- 5-99
Rama Lowjee, Sweeper ... ..	10	...	1-12-98	31- 5-99
Sidhu, Sweeper ... ..	10	12	7- 2-99	31- 5-99
Kala Pasu, Sweeper ... ..	10	...	7- 4-99	2- 4-99
Sakha, Sweeper ... ..	10	12	25- 4-99	31- 5-99
Bechar, Sweeper ... ..	10	12	3- 5-99	31- 5-99
Kankoo Tickam Doodha, Sweeper ... ..	10	12	1-12-98	2- 5-99
Galal Kankoo, Sweeper ... ..	12	...	4- 5-99	31- 5-99

The hospital consisted originally of three wards, dispensary, nurse's and hospital assistant's quarters, three rooms for servants and dead-house, which huts were erected and presented to the Committee by Mr. Vithal Sayana, and also contact huts built and presented to the Committee by Rao Bahadur Ellappa Ballaram. The contact huts have remained intact, while all the other buildings were gradually pulled down, in order to make place for more *pucca*-built structures, as the Committee realised, that the hopes at first entertained of a gradual dying out of the Plague during the year would not be fulfilled, and that there would be in all probability need of a hospital again after the monsoon. It must be remembered, that the structures erected by Mr. Vithal Sayana were only meant for temporary occupation, and that the monsoon would of course destroy them. The contact huts also, were not built to stand the monsoon, but it was not thought necessary to renew them, as the present accommodation will be found sufficient for patients and contacts, should the hospital have to be re-opened during the monsoon, and as it will not be a very difficult, nor expensive matter, to put the contact huts in order again after the monsoon. The present Wards and Quarters, etc., are built to stand about 4 to 5 seasons, and consist of the following :—

- 1 Pneumonic Ward, to hold about 8 beds, (presented by Lady Avabai Framjee Petit.)
- 1 Bubonic " " " 16 " (presented by Mr. Damodhar Goverdhandass Sukadhwalla.)
- 1 " " " 16 " (presented by Mr. N. M. Wadia, C.I.E.)
- 1 Observation Ward " " 16 " (presented by Mr. Assir Virjee.)
- 1 Office and Dispensary, ( " " N. M. Wadia, C.I.E.)
- 1 House for Nurse's quarters, ( " " Sulliman Abdul Wahid.)



- 1 House for Hospital Assistant, Assistant Nurse, and Clerk.
- 1 „ „ Kitchen and Storeroom.
- 1 „ „ High Caste Servants.
- 1 „ „ Low do. do.
- 1 „ „ Sweepers.

I attach a list of donors and amounts, subscribed to the Building fund, as well as a balance sheet, and I again beg to place on record the Committee's sincere thanks for these handsome donations. I also beg to thank Khan Bahadur Sirdar Mir Abdul Ali, Chief of the Criminal Investigation Department, for the great interest he has taken in the work. It is the Sirdar, who was almost solely instrumental in collecting the subscriptions and to whose untiring energy the erection of the buildings is due.

The latrines were built by the Committee with materials, lent for the purpose by the Municipality. They have corrugated iron sides and roof, and 5 seats built over a cement flooring. The pans into which the excreta were deposited, were regularly cleaned out by the Municipal Conservancy corps as was also the cesspool. Both latrines and cesspool were daily disinfected under the supervision of the Hospital Assistant, or Clerk.

The dead house is now pulled down, having only been a temporary concern, but the two washing platforms and cesspool which were constructed in a very thorough manner, and thickly coated with cement, are now in as good a state as at the beginning and the Committee will only require to rebuild the mortuary when necessary.

The patients' clothes as soon as they were removed from their person were handed over to the sweepers, who washed them in a strong solution of Hydrargyri Perchloride, after which they were rinsed in cold water and hung up to dry. They were then collected in a room, whence the Dhobie had to remove them in order to wash them thoroughly. I may add, that the clothes before being rinsed were allowed to remain in the Corrosive sublimate solution for about 12 hours. Additional disinfection in the steam disinfector would no doubt have been an extra safeguard, but this was not possible as our stock of clothing would not allow of the delay, which would necessarily have followed such a proceeding.

The water-supply was derived from the Municipal main, a special connection having been supplied for this purpose by the Municipality. As far as I can judge, the water-supply has at all times been sufficient for all requirements.

The wards were daily disinfected by means of Perchloride and Carbolic acid solution. Whenever a patient caused a mess on the floor, this was at once covered with Carbolic Acid or Sanitas Powder, and removed when the spot was immediately disinfected with solution. The floor and walls were whitewashed as often as was possible, at least however once a week.

On a death occurring, the patient was immediately wrapped up in a sheet, previously soaked in a strong solution of Perchloride. The body was then removed on its cot to the mortuary, where it was drenched in a solution of Perchloride. The relatives of the deceased were then at once notified, provided they were known, and the body was handed to them for immediate removal either at once, or, if the death occurred during the night, at daybreak next morning. The body was generally washed by the relatives on the washing platform, for which purpose a plentiful supply of disinfectants was always at their disposal. The usual funeral rites were then allowed to be performed and the body removed. After this, the sheet, if the case was not of a very virulent nature, was immersed in a strong corrosive sublimate solution, and



the cot was carefully brushed down with the same disinfectant, and both were allowed to dry in the sun. The cot was generally allowed to remain at least three days in the sun, before being used again. The sheet, after having been 12 hours in the disinfectant solution, and having thoroughly dried in the sun, was handed over to the dhobie. If the case was of a virulent nature the sheet was burned.

If a patient whose relations could not be found died, his body was handed over to the Paltan Road Department, whence a cart was sent to take the body away to be burned or interred, according to the religion or sect of the deceased.

No cases in which Professor Haffkine's serum had previously been employed have come under the notice of the Hospital Authorities. In fact, inoculation has not to my knowledge been practised at Colaba. I beg to refer to some suggestions I took the liberty to make on this point during last season.

No death has occurred amongst the members of the Staff, though several cases of suspicious fever have been registered, all of which yielded to immediate radical treatment. The Head-nurse had a narrow escape on one occasion, when in the execution of her duty she inadvertently had her hand scratched by the breaking of an enema syringe, the patient at the same time scalding her with urine. Though disinfection was immediately resorted to, and the Head-nurse took medicine immediately, signs of plague showed themselves within 24 hours, and the fact that no serious consequences followed, is due to the speedy application of energetic measures.

Some of the sweepers have from time to time suffered with mumps, aggravated by fever, but none of these cases were serious enough to merit special notice.

TABLE No. I.—*Total admissions during the year.*

Month.	Plague.	Relapsing fever.	Observation cases including all General diseases.	Total.
December 1898 ... ..	8	...	4	12
January 1899 ... ..	20	1	5	26
February „ ... ..	48	1	.....	49
March „ ... ..	83	1	3	87
April „ ... ..	56	...	2	58
May „ ... ..	28	1	8	37
Total ... ..	243	4	22	269

The highest number of admissions occurred during the week from the 9th to the 16th March 1899, *viz.*, 27.

The highest number of admissions made during one day, were on the 10th of March 1899, *viz.*, 8.

Total number of deaths from opening of hospital to the 31-5-99...	...	178
„ „ „ „ from plague „ „ „ „ „	...	174
Average weekly death rate...	...	6.9
Percentage of deaths to admissions...	...	66.17 per cent.

The largest number of deaths took place on the 22-4-99, *viz.*, 6.

TABLE No. II.

Heading.	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague ... ..	243	174	69	71·6 per cent.
Relapsing fever ... ..	4	1	3	25 "
Observation and other diseases.	22	3	19	13·64 "
Total ...	269	178	91	66·17 "

TABLE No. III.

Month.	Heading.	Total admissions.	Died within 24 hours.	Died within 48 hours.	Deaths.	Total Recoveries.	Percentage of Deaths.
December '98.	Plague ...	8	3	1	4	4	50 per cent.
	Relapsing fever	.....	.....	.....	.....	.....	.....
	Observation, etc.	4	1	.....	1	3	25 per cent.
January '99.	Plague ...	21	5	4	14	7	66·6 "
	Relapsing fever	1	1	.....	1	.....	100 "
	Observation, etc.	4	.....	.....	1	3	25 "
February "	Plague ...	48	17	11	40	8	83·4 "
	Relapsing fever	1	.....	.....	.....	1	.....
	Observation, etc.	.....	.....	.....	.....	.....	.....
March "	Plague ...	83	25	15	60	23	72·3 per cent.
	Relapsing fever	1	.....	.....	.....	1	.....
	Observation, etc.	3	.....	.....	.....	3	.....
April "	Plague ...	55	8	17	41	14	74·6 per cent.
	Relapsing fever	.....	.....	.....	.....	.....	.....
	Observation, etc.	3	.....	.....	.....	3	.....
May "	Plague ...	28	6	6	15	13	53·6 per cent.
	Relapsing fever	1	.....	.....	.....	1	.....
	Observation, etc.	8	.....	.....	1	7	12·5 per cent.
	Total ...	269	66	54	178	91	66·17 per cent.
Total	Plague ...	243	64	54	174	69	72·2 per cent.
	Relapsing fever	4	1	.....	1	3	25 "
	Observation, etc.	22	1	.....	3	19	13·7 "
		269	66	54	178	91	66·17 per cent.

TABLE No. IV.

Sex.	Total admissions.	Deaths.	Recoveries.	Percentage of Deaths.
Hindu males ... ..	156	108	48	69 per cent.
" females ... ..	68	44	24	64·7 "
" children below 12.	23	13	10	56·5 "
Mahomedan males ...	19	7	3	70 "
" females ... ..	2	1	1	50 "
" children below 12.	1	.....	1	.....
Parsees ... ..	.....	.....	.....	.....
Eurasians ... ..	.....	.....	.....	.....
Jews ... ..	.....	.....	.....	.....
Christians males ...	3	3	.....	100 per cent.
" females ... ..	3	1	2	33·3 "
" children below 12.	3	1	2	33·3 "
Total males ... ..	169	118	51	69·76 per cent.
" females ... ..	73	46	27	63·10 "
" children ... ..	27	14	13	51·5 "
Grand Total ...	269	178	91	66·17 per cent.

TABLE No. V.—*Mortality for the year amongst sexes and children.*

Total mortality.	Mortality amongst males.	Females.	Children below 12.
269	118	46	14

TABLE No. VI.—*Table showing the situation of Buboes.*

Situation.	Total number.	Males.	Females.	Deaths.	Recoveries.	Percentage of Deaths.
Cervical ... ..	13	8	5	9	4	69·25 per cent.
Parotid ... ..	1	1	.....	1	.....	100 „
R. Axillary ... ..	23	11	12	17	6	73·9 „
L. „ ... ..	10	7	3	7	3	70 „
R. Femoral ... ..	20	11	9	14	6	70 „
L. „ ... ..	37	28	9	29	8	78·4 „
R. Inguinal ... ..	14	12	2	12	2	85·7 „
L. „ ... ..	15	11	4	13	2	86·7 „
Other Situations ... ..	.....	.....	.....	.....	.....	.....
No Buboes ... ..	23	12	11	17	6	73·9 per cent.
Multiple Buboes ... ..	21	10	11	16	5	76·2 „

TABLE No. VII.—*Table showing Pneumonic Plague without Buboes.*

Sex.	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	36	29	7	80·55 per cent.
Females ... ..	11	8	3	72·73 „
Children ... ..	2	1	1	50 „

TABLE No. VIII.

Sex.	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	8	4	4	50 per cent.
Females ... ..	2	2	.....	100 „
Children ... ..	.....	.....	.....	.....

*Clinical.*—Charts of Pneumonic Plague cases are attached.

*Clinical.*—Charts of a few typical Bubonic cases are attached.

*'Roux' and Lustig's Serum.*—No such serum has been employed in the Stuart Strong Hospital, though the Committee has taken great interest in the question.



A deputation called some time ago on the Medical Officer, Arthur Road Hospital, and on the Bacteriologist with a view to ascertaining, whether the time had come, when the employment of serum had left the experimental stage. Though Dr. Choksi expressed a very high opinion of the serum, which was endorsed by the Bacteriologist, the Committee could not then commence making experiments at the Stuart Strong Hospital, firstly, because there was little chance of getting a supply of the serum, and secondly, as the number of admissions at that time had commenced to decrease, the plague being generally on the wane.

The matter will be taken up again, if the hospital is re-opened.

*Remarks on symptoms.*—Progress of disease, etc. I have no special remarks to make on this point.

C. HUMMEL,

*Honorary Secretary, S. S. Hospital.*

BOMBAY, the 25th July 1899.

This hospital was built on open ground facing the sea at Colaba, and was very useful in giving relief to the sick of Colaba. The mill hands are many, and they availed themselves of it. The Committee is to be congratulated on the Model Hospital and camp they erected with the help of subscriptions obtained through Sirdar Khan Bahadur Mir Abdool Alli, who took a strong personal interest in this work.

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No. 9.

**Report on the Port Trust Plague Hospital, Bombay,  
from the 27th September 1898 to 31st May 1899.**

2. The hospital situated at Bhusaval Street was re-opened for Port Trust people, Dock labourers and their relations, on the 27th September 1898, by the Trustees of the Port of Bombay, under the charge of Dr. Shivdas Parmanandas, the Medical Officer.

Staff:—

- 1 Hospital Assistant.
- 1 Compounder.
- Ward-boys (engaged according to requirements, 12 being the maximum number).
- 2 Ayahs.
- 1 Cook.
- 2 Sweepers.
- 2 Ramosis.
- 1 Dhobi.

3. Description of the hospital buildings, &c., as per plan annexed herewith. There was accommodation for 40 to 50 patients. Altogether 185 people occupied the contact camp.

A special separate health camp was also provided for evicts on the other side of the Elphinstone Bridge.

4. Conservancy:—

Six-seated temporary latrines with moveable iron pan were fitted, and the excreta, after being thoroughly disinfected, were removed by the Hospital Staff Bhungees.

The clothes, previous to washing by Dhobi, were kept for about 12 hours in a solution of Perchloride of Mercury 1—1,000.

5. Water-supply was drawn by a branch connection from the Municipal Main.

6. The wards and other buildings were periodically lime-washed in and out, including the floors. The disinfectants used for the buildings, wards, &c., were—

Corrosive sublimate solution 1 in 1,000.

Solution of Carbolic acid 5 per cent. P. C.

Dry Carbolic Powder and Phenyle solution.

The clothes were disinfected as stated in paragraph No. 4, and exposed to the sun's heat and ironed, except those that necessitated destruction by fire.

7. Soon after death, the bodies were removed to the mortuary, the bodies being enveloped in sheets saturated with Perchloride of Mercury solution.

The pauper patients, who died, were disposed of, according to their religious methods, at the expense of the Trustees.

8. None of the patients were previously inoculated with Haffkine's serum.

9. The Hospital Staff enjoyed good health. None having got infection.

TABLE I.

10. Total admissions during the year:—

Months.	Plague.	Relapsing Fever.	Observation cases, including all general dis- eases.	Total.
1898.				
September ... ..	.....	1	.....	1
October ... ..	12	1	3	16
November ... ..	4	.....	.....	4
December ... ..	10	.....	4	14
1899.				
January ... ..	13	1	3	17
February ... ..	44	2	7	53
March ... ..	38	.....	2	40
April ... ..	16	1	3	20
May ... ..	11	1	1	13

11. The largest number of admissions during the week, from 25th February to 4th March 1899, was 13, and on the 23rd February 1899 as many as 8 patients were admitted.

12. The total number of deaths during the year was 110, the Plague deaths being 108. The largest number of total weekly deaths was 10 in the week from 25th February to 4th March 1899, and the largest number of deaths was 3 on the 16th March 1899.

TABLE II.

	Admissions	Deaths.	Recoveries.	Percentage of Mortality.	Remarks.
Plague ... ..	148	108	40	72.9	*Of these, 4 patients developed Plague.
Relapsing Fever ... ..	7	1	6	14.2	
Observation and other dis- eases.	*23	1	18	4.3	
Total... Rs.	178	110	64	61.7	

TABLE III.—*Plague.*

Months.	Total admissions.	Died with- in 24 hours.	Died with- in 48 hours.	Total deaths.	Total recoveries.	Per- centage of deaths.
1898.						
September ... ..	...	...	...	...	...	...
October ... ..	12	2	2	8	4	66·6
November ... ..	4	...	1	3	1	75·0
December ... ..	10	...	1	6	4	60·0
1899.						
January ... ..	13	4	1	7	6	53·8
February ... ..	44	18	5	37	7	84·0
March ... ..	38	7	9	31	7	81·5
April... ..	16	3	1	9	7	56·2
May ... ..	11	2	2	7	4	63·6

TABLE III A.—*Relapsing Fever.*

Months.	Total admissions.	Total deaths.	Total recoveries.	Percentage of deaths.
1898.				
September ... ..	1	1	.....	100·0
October ... ..	1	.....	1	0·0
November ... ..	.....	.....	.....	.....
December ... ..	.....	.....	.....	.....
1899.				
January ... ..	1	.....	1	0·0
February ... ..	2	.....	2	0·0
March ... ..	.....	.....	.....	.....
April ... ..	1	.....	1	0·0
May ... ..	1	.....	1	0·0

TABLE IV.—*Hindus.*

	Total admissions.	Deaths.	Recoveries.	Percentage of deaths.
Males ... ..	93	66	27	70·9
Females ... ..	26	21	5	80·7
Children (under 12 years) ...	19	14	5	73·6

TABLE IV A.—*Mahomedans.*

	Total admissions.	Deaths.	Recoveries.	Percentage of Deaths.
Males ... ..	7	4	3	57·1
Females ... ..	1	1	.....	100·0
Children ... ..	.....	.....	.....	.....



TABLE IV B.—*Christians.*

	Total admissions.	Deaths.	Recoveries.	Percentage of deaths.
Males ... ..	2	2	.....	100·0
Females ... ..	.....	.....	.....	.....
Children ... ..	.....	.....	.....	.....

TABLE V.—*Table showing the mortality for the year amongst sexes and children.*

Total Mortality for the year.	Mortality amongst men.	Mortality amongst women.	Mortality amongst children all under 12 years of age.
108	72	22	14

TABLE VI.—*Table showing the situation of Buboes.*

Situation.	Total number of cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of mortality.
Cervical ...	7	5	2	4	3	57·1
Parotid ...	1	1	...	...	1	0·0
R. Axillary ...	9	7	2	9	...	100·0
L. do. ...	11	7	4	8	3	72·7
R. Femoral ...	43	34	9	28	15	65·1
L. do. ...	32	22	10	25	7	78·1
R. Inguinal ...	5	3	2	2	3	40·0
L. do. ...	8	7	1	6	2	75·0
Other situations ...	*1	1	...	1	...	100·0
No Buboes ...	22	17	5	20	2	90·9
Multiple Buboes ...	9	7	2	5	4	55·5

\* In this case the bubo was situated over the right arm just above the elbow joint.

TABLE VII.—*Table showing Pneumonic Plague (with Buboes).*

	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	17	16	*1	94·1
Females ... ..	5	4	1	80·0
Children ... ..	...	...	...	...

*Note.*—This case was physically and bacteriologically examined by the Plague Commissioners and was injected by the Curative Serum of Roux.

TABLE VIII.

*Table showing cases of Secondary Plague Pneumonia (complicated with Buboes.)*

			Admitted.	Died.	Recovered.	Percentage of mortality.
Males	...	...	9	4	5	44.4
Females	...	...	7	6	1	85.7
Children	...	...	...	...	...	...

*Note.*—Pneumonia supervened invariably after the appearance of the Buboes.

*Symptoms and Character.*

The usual glands affected are the femoral, inguinal axillary and cervical regions. The swellings consist of single glands, chain of glands or two or more separate glands. The glands subside and generally disappear or suppurate and burst.

*Medical Treatment.*

As regards the steam bath treatment, I may say that, out of 15 patients taken numerically as they were admitted, 3 recovered and 12 died.

The wet packing treatment was adopted in 35 patients, out of which 12 recovered. The cases were not selected but were also taken numerically as they were admitted.

The period of incubation varied in different cases. From information and history of the patient, it was found that the incubation varied from 3 to 10 days.

True copies of typical chart of an interesting acute case with multiple buboes and Secondary pneumonia ending in recovery and a whole case with full notes and charts of a Primary Plague Pneumonia seen and bacteriologically examined, and injected with Roux's serum by the Plague Commissioners, have been herewith annexed.

*Character and situation of Buboes.*

Circumscribed or spreading, or conglomerated, hard and painful single or multiple buboes are found generally in the cervical, axillary, femoral and inguinal regions.

These buboes may appear either at the onset or within six or eight days. The most fatal form of buboes under my observation was the axillary one.

The convalescence of plague patients was often very protracted.

Thirty cases were kept under observation, out of which 4 developed plague, 7 relapsing fever, and others turned out ordinary cases of fever.

Only one case was subjected to the treatment by the curative serum of Roux, full particulars of which with its notes and chart have been herewith sent.

SHIVDAS PARMANANDAS,

*Medical Officer, Bombay Port Trust.*

BOMBAY, 22nd July 1899.

Notes by  
the Special  
Medical Officer.

A well-planned and conducted hospital for the use of the Dock labourers : Dr. Parmanandas took a great deal of interest in his work. This Hospital is situated on open ground near the Docks and had its own Contact Camp near.

The interesting case of Pneumonic Plague quoted was seen by Professor Wright. I regret I am unable to publish the plan of the Hospital, I would have done so had it been on a small scale.

## BOMBAY PORT TRUST HOSPITAL.

R. No. 21.

Name—SANTU KUSABA.

Date—14th February 1899.

Age.		Disease.	Duration of Disease.	Occupation.	Locality of Residence.	Caste.	How long resident in Bombay.
Years.	Months.						
30	...	Pneumonic Plague.	Five days.	Dock Labourer.	Durgadevi Tambat Gally, Khatka's Dadar.	Hindu, Ghati.	2 years.

Brought to the hospital in an unconscious condition suffering from fever and cough.

*Present Condition.*—The patient is of fairly built constitution. Temperature on admission 100·6; pulse 114; weak and compressible. Body is hot and dry. Eyes injected, staggering gait; is very delirious. No glandular enlargement. Tongue is dry and coated, is vomiting; bowels constipated. Respirations 37 per minute; hurried, troublesome hacking cough; sputum scanty, sticky and rusty coloured, on percussion dull patches here and there on the back of the left lung posteriorly near the base. Fine crepitations and bronchial rales are heard all over the both lungs.

Amm. Carb. gr. xii, Vinī. Ipecac. ʒss, Tinct. Cinch. Co. ʒ iii, Syrup Tolu. ʒ ii Tint. Digitalis m. 45, Spt. Vinī. Gallis. ʒss ip. Aqua. ad ʒ vi.  $\frac{1}{6}$ th part every 3 hours.

Jacket Linseed poultice to the chest to be repeatedly changed.

Spt. Vinī gall, quantity as directed to be given with warm water when necessary.

*Previous history by his friend.*—Five days ago he got chill, followed by fever and slight cough. On the second day the cough increased and the patient complained of pain in the left side of the chest, and his eyes became red, fever increased and the patient was unable to support himself; gradually he became delirious. Thinking that he was getting worse, his friends brought him voluntarily to the hospital for treatment.

*Vesper.*—Temp. 104°; pulse 125, rapid, soft and compressible. Breathing hurried, 40 per minute, otherwise same as this morning. Bowels not moved.

15th.—Temp. 102°; pulse 115, soft and compressible. Resp. 38 per minute. Bowels not moved. Brings up sputum with great difficulty. Expectoration viscid but less rusty. Auscultation and percussion revealed sounds as on the first. Patient still delirious; cough frequent. Had no sleep last night and frequently became violent. Tongue is still dry and coated.

15th—Mixture. Senna Co. ʒ ip. Mag. Sulp. ʒ iii. ft. haustus status.

Rept. Mixture. Rept. stimulants as necessary. Rept. Poultice to chest.

*Vesper.*—Temp. 101·2; skin dry, pulse 118, weak and compressible, resp. 36, otherwise much the same.

16th.—Temp. 101·6; pulse 115, slightly better in volume, respiration 37. Dulness over the base of the left lung more marked, moist roles are heard all over the chest and crepitations over the base of the left lung. The patient is not very delirious. Bowels



opened twice. Tongue is still dry and coated; cough is not so troublesome. Breathing is easier; slept for about four hours during the night. Expectoration not rusty, but very sticky.

*Diet, &c.*—M. D. and Essence of Chicken.

16th—Ammonia Carb. gr. xii, Vinī Ipeca. 3gs., Tinc. Cincho. Co. ziii., Syrup Tolu. 3 ii., Tinc. Digitalism 45, Spt. Vinī gallic 3 ip., Aqua ad. 3vi:  $\frac{1}{2}$  part every 3 hours.

Rept. stimulant. Rept. Poultice.

*Specimen* of expectoration sent to Colonel Wilkins for microscopical examination.

*Reply*—Plague germs found in sputum.

*Vesper*—Temp. at 3 P.M. 102.6; pulse 115; respirations 38 per minute. Slight perspiration on the forehead.

4 P.M.—Temp. 101.

At about 5 P.M., Members of the Plague Commission visited the patient and examined him, when they injected 20 cc. Roux's serum hypodermically and gave another intra-venous injection of 20 cc. in the right arm. When the respirations were 48 per minute. Percussion shows dulness over the lower part of the left lung.

16th, 6 P.M.—Temp. 99.4; pulse 110; respirations 36 per minute.

9 P.M.—Temp. 100; pulse 112; respirations 36.

12 MIDNIGHT—Temp. 99; pulse 102; respirations 40 per minute.

17th, 3 A.M.—Temp. 97; pulse 96; respiration 42.

7 A.M.—Temp. 99.4; pulse 112, better in volume, than yesterday. Respiration, 34, Passed urine freely. Is in better senses; slept fairly well. Cough not very troublesome during the night. Percussion shows dulness over the lower part of the left lung posteriorly. Expectoration scanty, mucoid and sticky. Moist rales are distinctly heard at the base of the left lung. Tongue dry and coated with white fur, except at the tip where it is moist. Bowels not moved since yesterday morning.

17th—Repeat Mixture; Repeat, stimulant as necessary.

Repeat Poultice to the chest.

9 A.M.—Temp. 99.6; pulse 114; resp. 36.

11 A.M.—Temp. 100; pulse 112; resp. 36.

3-30 P.M.—Temp. 100.4; pulse 116; better in volume. Resp. 36.

6 P.M.—Temp. 100; pulse 116; resp. 34.

Mixture Senna Co. 3ip., Mag. Sulp. 3iii, ft. haustus status.

10 P.M.—Temp. 97.6; pulse 112; resp. 34.

*Remarks.*—Three specimens of sputum (taken at different hours during the night of 16th after injection of Roux's serum) sent for examination at Municipal Laboratory, shewed multiplication of plague germs than were seen in the specimens examined before injection of Roux's serum.

18th, 7 A.M.—Temp. 97; pulse 112, rather weak and small in volume. Bowels opened once this morning. Resp. 30. Cough is less troublesome. Expectoration is scanty, sticky and mucoid. Moist crepitant rales well marked at the base, but are

also heard at different parts of the lungs. Dulness on percussion is less marked than yesterday. Tongue is moist and clean; slept well last night; slightly delirious and sometimes passes urine in bed.

18th—Repeat mixture, adding Liqr. strych. m. xii.

Repeat stimulant as necessary. Repeat poultice.

*Vesper*.—Temp. 99; pulse 112; resp. 34.

10 P.M.—Temp. 98; pulse 110; resp. 36.

19th—Temp. 97.4; pulse 100; resp. 30. Bowels not moved since yesterday morning. Tongue is clean but slightly dry. He gets occasional attacks of cough. Expectoration is scanty, tenacious and mucoid. Dulness less marked than yesterday; moist rales are heard as before.

19th Ammonia Carb. gr. xii, Tinc. Cinch. Co. zii., Vinī Ipeca. m. 20, Tinc. Senega zip., Syrup Tolu zip., Spt. Vinī gallic zip., Tinc. Digitalis m. 20, Liqr. Strych. m. viii. Aqua ad; ziv, zi every 4 hours.

Repeat poultice to chest. Spt. Vinī gallic occasionally with mixture as necessary.

*Vesper*—Temp. 98.2; resp. 33; pulse 104.

20th—Temp. 97; pulse 84, fair in volume. Crepitant rales less marked than yesterday. Dulness as before. Cough is much less. Bowels opened once. Tongue is moist and clean. Passes urine freely. Not at all delirious and feels better.

20th—Repeat Mixture. Rept. poultice. Repeat stimulant.

*Vesper*—Temp. 97.4; pulse 90; resp. 27 per minute.

21st—Temp. 97; pulse 88, fair in volume; resp. 26. Cough is much less, slight expectoration; moist rales are only heard occasionally. Dulness slightly marked. Slept well. Feels much better; but complains of weakness.

21st—Repeat mixture. Repeat stimulant as necessary.

Repeat poultice to chest.

*Vespers*—Temp. 97.6; pulse 88; resp. 24.

22nd—Temp. 97; Pulse 75; resp. 22. Cough much less. Expectoration very slight. Bowels not moved for the last two days. Tongue is moist and clean; gets sound sleep. Takes nourishment.

22nd—Repeat mixture. Repeat stimulant. Repeat poultice.

*Vesper*—Temp. 97.4; pulse 78; resp. 22.

23rd—Temp. 97; pulse 72; resp. 19. Cough much less and occasional. Rales pure and faintly heard. Expectoration slight; no dulness. Bowels opened twice.

Repeat mixture. Repeat stimulant. Repeat poultice.

*Vesper*.—97.4; pulse 76; resp. 20.

24th—Temp. 96.6; pulse 75; resp. 17. Bowels opened twice. Tongue is moist and clean. Diet.—O. D. Extra milk is doing well.

Repeat mixture 3 doses. Repeat stimulants. Repeat poultice.

Afterwards the patient made a steady recovery and was discharged recovered from the hospital on 16th March 1899.

## Report on the Parel Sarvajanik Hospital, Bombay, from the 16th January 1899 to 2nd June 1899.

### History of Hospital.

I. The Municipality having decided that Government House, Parel, would not be opened as a hospital, a meeting of the Volunteer Committees of F and G Wards was held at Government House, Parel, early in November under the Chairmanship of Rao Bahadur Vassanjee Khimjee, J. P., and the following resolutions were passed :—

1. That a private hospital should be erected in Government House, Parel Compound, by voluntary subscriptions, provided that the necessary sanction be granted by the Municipal authorities.

2. That the hospital should be for all castes and creeds and should, therefore, be called "The Parel Sarvajanik Hospital."

3. That the following gentlemen be asked to act as a Managing Committee and to collect subscriptions :—

Rao Bahadur Vassanjee Khimjee, J.P., Chairman.	Mr. A. N. Dalvi, Member.
Mr. Lakhamsee Napoo, J.P., Hon. Treasurer.	Mr. V. R. Luxman, do.
Mr. J. F. Madan, Hon. Secretary.	Mr. W. R. Jayakar, do.
Khan Saheb Shaik Adam Essoof- bhoy, J.P., Member.	Mr. Raojee Raghoonath, do.
	Mr. Adam Abba Patel, do.

4. That the hospital should be for 30 beds for patients with Office, Dispensary, Hospital Assistant's Quarters and other necessary buildings. The number of beds was afterwards increased to 84.

### Hospital opened.

II. The necessary sanction for the building of the Hospital having been obtained and subscriptions coming in freely, it was ready for the admittance of patients by January 16th, 1899, when it was opened by SIR ANDREW WINGATE, I.C.S., *Plague Commissioner, Bombay Presidency.*

### Hopitals closed.

III. The hospital was closed on May 31st, 1899, and was finally closed on June 2nd, 1899.

### Staff.

IV. Dr. G. W. Lewis, District Medical Officer, Central District, kindly volunteered his services as Medical Officer to the hospital and was in charge of the hospital until it closed.

The Government lent the Committee the services of a Lady Nurse.

Lady Nurse Miss Reynolds was on duty in the hospital until being appointed to the Indian Nursing Service on 15th April, when Lady Nurse Miss Burrows took over the duties.

The Committee wish to express their thanks to Dr. G. W. Lewis, Miss Reynolds and Miss Burrows for their excellent services and for the kind way in which their duties were carried out. The remainder of the staff were paid out of the subscriptions and was as under :—

Hospital Assistant Gangaram Vithal, Night Nurse Miss Planford, Ward Boys 8, Ayahs 4, Cook 1, Dhobies 2, Sweepers 4.

Ground and ridge ventilation was provided for in all the huts.

The partitions between the rooms were about 8 ft. high. Separate cook-rooms were provided for all castes. The other buildings erected were—Hospital Assistant's Quarters, Dispensary, Office, Washing and Disinfecting places for men and women, Dhobi Ghat, Store Room and Police Chauky.



The quarters that were originally meant for servants' quarters were turned into a ward and some of the cook-rooms were utilized for the servants.

A plan of the hospital is attached and shows fully the number of wards and all buildings.

**Hospital.**

V. The most important feature of the hospital was the provision of a separate room for each patient. This seems specially necessary in a hospital to which persons of all castes are admitted. Some freedom was given in allowing friends and relatives to be present and the patients always seemed far happier, each in his own room, than in a big ward where they are constantly exposed to the sufferings of others and the only too frequent removal of the dead. Of course, this system considerably increases the difficulties of the nursing staff, but its extremely beneficial effect to the mental condition of the patients, a most important point in plague, is undoubted.

**Conservancy.**

VI. There was one block of latrines consisting of five seats. Two seats were reserved for women and 3 for men. The building was of corrugated iron. The sewage was removed by the sweepers in the ordinary way and emptied into a sewage cart placed at the outskirts of Parel Village.

All clothes, on being removed from the hospital, were taken to the outer compound and placed in large tubs filled with a strong solution of Phenyle ; after being soaked for some time they were laid or hung out in the sun and then handed over to the Dhobies.

**Water supply.**

VII. The water was laid on from the Vehar main by the Water Department.

VIII. The principal disinfectant used was Carbolic Powder which was plentifully sprinkled over all the floors in the hospital two or three times a day.

The huts and floors were not lime-washed.

The buildings being of matting with a good draft of air through them, it was not considered necessary to use Perchloride often.

The Steam Disinfector was not used as it was too far off.

**Disposal of the Dead.**

IX. As a rule the dead were removed by their friends or relatives.

Unclaimed bodies were removed in the following ways :—

*Hindus* by Hindu sweepers at a cost of Rs. 2 per body which was paid out of the Discretionary Relief Fund by order of the Chief Accountant. Efforts were made to get better class Hindus to do this work but it was found to be impossible.

*Mahomedans.*—These bodies were removed under arrangements with a Mulvi who resides near at hand. The cost was Rs. 10 per body and was paid in the same way as for Hindu bodies.

*Christians.*—The Health Department was notified and they sent a hearse free of charge and made all arrangements. The mortuary was a small building containing 8 small rooms, each of which would hold a body.

There were no doors to this building and plenty of ventilation was secured.

The ground in the rooms and all round outside where the people prepared the bodies for burial was kept well disinfected.

The people were given disinfectants to wash in after handling the corpse.

**Personal Explanation.**

X. From this point in the report most of the paras. are entirely of a medical nature and as the Doctor has left Bombay I can only state what I have been able to gather from the records.

**Inoculation.**

XI. Seven patients were known to have been previously inoculated with Haffkine's Serum, out of these 4 died and 3 recovered.

XII. There was no case of sickness of any sort or kind amongst the staff.

TABLE I.

XIII. The total number of admissions, from January 16th to May 21st was 601.

From F Ward	...	...	...	...	350
" G "	...	...	...	...	223
Other Wards	...	...	...	...	38

Out of this number 540 were plague patients and the remaining 61 of other diseases.

XIV. The following table shows the weekly admissions and that the week ending March 25th had the largest number.

The largest daily admission was 16 on March 19th, 1899.

Week ending				Total Admissions.	Remarks.
21st January 1899	...	...	...	11	One day less.
28th Do.	...	...	...	22	
4th February 1899	...	...	...	32	
11th Do.	...	...	...	36	
18th Do.	...	...	...	32	
25th Do.	...	...	...	41	
4th March 1899	...	...	...	45	
11th Do.	...	...	...	50	
18th Do.	...	...	...	50	
25th Do.	...	...	...	61	
1st April 1899	...	...	...	41	Largest admission.
8th Do.	...	...	...	44	
15th Do.	...	...	...	29	
22nd Do.	...	...	...	27	
29th Do.	...	...	...	24	
6th May 1899	...	...	...	22	
13th Do.	...	...	...	22	
20th Do.	...	...	...	11	
21st May (closing day)	...	...	...	1	
Total				601	

TABLE II.

Disease.				Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague	...	...	...	540	374	166	69.2
Relapsing Fever	...	...	...	5	.....	.....	.....
Observation and other Diseases	...	...	...	56	24	37	40.9
Total				601	398	203	65.4

TABLE III.

Months.				Total Admissions.	Died within 24 hours.	Died within 48 hours.	Total Deaths.	Total Recoveries.	Percentage of Deaths.
January 16th to 31st	...	...	...	45	12	21	33	12	73.3
February	...	...	...	146	55	33	88	58	60.2
March	...	...	...	226	83	69	152	74	67.2
April	...	...	...	129	56	30	86	43	66.6
May 18th	...	...	...	55	20	19	39	16	70.9
Total				601	226	172	398	203	65.4

TABLE IV.

	Total Admissions. All diseases.	Deaths.	Recoveries.	Percentage of Deaths.
<i>Christians.</i>				
Males ... ..	26	16	10	61.5
Females ... ..	10	6	4	60.0
Children (under 12 years) ...	6	5	1	82.3
<i>Hindus.</i>				
Males ... ..	235	230	105	68.6
Females ... ..	117	78	39	66.6
Children (under 12 years) ...	88	52	36	59.0
<i>Mahomedans.</i>				
Males ... ..	17	11	6	64.7
Females ... ..	1	...	1	...
Children (under 12 years) ...	1	...	1	...
	601	398	203	.....

Table showing the Situation of Buboes.

Situation.	Total No. of Cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of Mortality.
Cervical ... ..	32	22	10	18	14	56.25
Parotid ... ..	3	3	.....	2	1	66.6
R. Axillary ... ..	46	30	16	35	11	76.8
L. „ ... ..	43	26	17	33	10	76.7
R. Groin ... ..	155	122	33	112	43	72.25
L. „ ... ..	132	93	39	94	38	71.21
Other Situation ... ..	2	1	1	2	.....	.....
No Buboes ... ..	80	57	23	50	30	62.2
Multiple Buboes ... ..	26	17	9	13	13	50

Table showing Pneumonic Plague (without Buboes).

	Admitted.	Died.	Recoveries.	Percentage of Mortality.
Males ... ..	17	11	6	54.54
Females ... ..	3	3	.....	.....
Children ... ..	1	1	.....	.....

Table showing cases of Secondary Plague Pneumonia (complicated with Buboes).

	Admitted.	Died.	Recoveries.	Percentage of Mortality.
Males ... ..	2	2	.....	.....
Females ... ..	.....	.....	.....	.....
Children ... ..	1	1	.....	.....

*Buboes.*—Percentage of mortality was the highest in cases of axillary buboes, (the right and left sides being nearly equal in this respect) and it was the lowest in cases with multiple buboes. The axillary buboes may, therefore, be said to be the most fatal form.

*Complication.*—In two cases pregnancy was complicated with an attack of Plague, one of these ended fatally, while the other recovered, but in neither of them did miscarriage occur.



Fifty-eight cases were kept under observation, out of these, 5 turned out to be *Relapsing Fever*, and the rest of other diseases mostly of *Remittent Fever*, and *Febricula*, a few were of *Phthisis*.

Rao Bahadur Vassanji Khimji collected the greater part of the subscriptions and it was mainly due to his influence and energy in collecting subscriptions that it was possible to maintain the hospital and have a balance of Rs. 2,000 odd in case of future need.

The thanks of the Committee are due to—

The Municipal authorities who lent matting and bamboos for the erection of the hospital and also supplied stores and medicines.

The Improvement Trust who gave the use of the ground free of charge.

The Government for the services of the Lady Nurses.

To all those gentlemen who subscribed so freely and willingly towards the fund.

P. LEWES, CAPT.,

*D. O. G. and F. Wards.*

PAREL, 23rd July 1899.

Notes by  
the Special  
Medical  
Officer.

A most useful hospital and one badly required for the North of Bombay. Rao Bahadur Vassanji Khimji was indefatigable in his endeavours in supervising and seeing after the hospital; and the fact that over 600 cases were treated and kindly looked after during 4 months, speaks for itself. The situation and general management of this hospital was excellent.

#### No. 11.

### Adamji Peerbhoy Borah Plague Hospital.

1. Report on the Adamji Peerbhoy Borah Fever (or Plague) Hospital, situated on Queen's Road, Bombay, from the 1st June 1898, to the 31st May 1899.

2. The hospital was founded for the Borah community by Mr. Adamji Peerbhoy, J. P. It was opened in the month of March (9th) 1897, when the plague being properly recognised, measures were formulated for the removal and treatments of plague patients in private hospitals, since that time it had been never closed. It is maintained exclusively by Mr. Adamji Peerbhoy, whose philanthropy as well as charity for the members of his own community (Borahs), is far and extended, and whose hand is ever ready to render assistance to the poor, ignorant Borahs in educating them in the different ways and walks of life, and in improving the condition of their families. In fact, the buildings, in which the plague hospital is at present located with its adjoining portion constituted originally a charitable institution, called the Borah sanitarium, designed for the use of Borah travellers and invalids or convalescents requiring change to a healthy place for the benefit of health.

The names of Committee looking after the hospital management are :—

Adamji Peerbhoy, Esq., J.P.

Mahomedbhoy Adamji Peerbhoy, Esq., J.P.

Abdulbhai Adamji Peerbhoy, Esq., J.P.

Khan Saheb Hakoem Dayam, J.P.

There are two medical officers. One in charge of the hospital is a graduate of the Bombay University (L. M. and S.) by name D. R. Khote, and the other Khan Saheb Abdulla Hiptoola Misri is a Hakeem, knowing Unani medicines. He resides

in a room of the convalescent ward, day and night, and works as a resident officer superintending the diet and other necessities of plague patients. The remaining persons of the hospital staff are :—

Compounder	...	...	...	...	1 (and two when more work.)
Clerk	...	...	...	...	1
Nurses (Native)	...	...	...	...	2
Ward-boys	...	...	...	...	6
Sweepers (Bhungue)	...	...	...	...	2 Male and female.
Cooks	...	...	...	...	2
Gardener (Mallee)	...	...	...	...	1
Ramosee, Bhaya	...	...	...	...	1
Dhobie	...	...	...	...	1
Servant (to keep the hospital clean)	...	...	...	...	1

There are no donations to the hospital. Mr. Adamji is willing to carry out the expenses of the hospital himself.

3. The hospital buildings are situated on Queen's Road, just opposite Churney Road Station facing the sea. As already stated, these buildings form two-thirds of the sanitarium, converted into hospital for plague purposes. The sanitarium, opened at a great expenso by Mr. Adamji from pure motives of charity to his own sect, is built upon the best sanitary principles as regards free and thorough ventilation of the buildings on all sides and of each of the rooms constituting it. It is divided into three parts or buildings, each being separated from the other by a very broad open passage leading to the Queen's Road. Each building consists of a ground floor and a first floor with a wide extensive verandah serving as a roof. Its plinth is considerably high and it has a small verandah on the ground floor on the side of the sea. It consists both on the ground and first floors of two rows of rooms with a wide, free open passage between them. The rooms are large, commodious, thoroughly exposed to the fresh sea-breeze and to the benign rays of the sun. Their walls and floor are *pucca* chunam-built. Each room has two large, wide windows with shutters and a door or two of such good height and width, and so built that the air passes very freely and unopposed in and out and is conveyed to all the parts of the room. The rooms on the side of the sea (8 in number) are greater in area than those of the opposite side, (7 in number) but all of them are large in all their dimensions. Each room on the side of the sea can hold two or three patients (large three, and small two), with perfect freedom and great convenience, while one, on the other side, can accommodate one patient with ease and comfort. Added to these buildings is a mosque for devotional purposes. The portion next to the mosque is kept for hospital use as a ward for acute cases. The first floor of the middle building is utilised as a convalescent ward, while the rooms on the ground floor are used for contacts. On the back of these buildings is an open, wide compound in one corner of which, behind the mosque, are situated 6 rooms. They serve as kitchen and store rooms. Behind the compound is an old Borah mortuary not now in use. There is a well and a garden in the hospital compound. There is accommodation mado for Dhobies to wash hospital clothes close to the hospital. There are small tanks built for storing up water, there are also water pipes.

*Dispensary.*—The two rooms on the first floor of the ward for acute cases are mado use of as Dispensary and Medical Officer's room. Dispensary contains European medicines and ordinary surgical appliances and instruments.

The servants (ward-boys), after work, retire to rest on the open verandah above the first floor of the building. They have no separate quarters for them. They are fed at the expense of the hospital in the hospital compound. The gardener, however, has wooden-built quarters allotted to him.



Contact sheds are *pucca*-built rooms on the ground floor of the middle building. The number occupying them was 210.

4. The latrines are situated between the rooms (but at a distance behind them,) on the side not facing the sea. They are two on the ground floor and two on the first floor both in acute and convalescent wards. They are large, *pucca*-built, well-ventilated, kept always clean by resident sweepers, and thoroughly disinfected by phenyle solution.

The excreta (motions) of plague patients as well as urine, vomit, &c., are carried immediately by sweepers in tin or earthen chatties. They are previously washed either with iodine or phenyle solution, and sprinkled over inside with carbolic powder. The excreta, &c., are thrown into the latrines which are then well-cleaned with water and thoroughly disinfected with phenyle or carbolic or permanganate of potash solution. Sewage and sullage are carried by underground drains.

There are four seats in the acute cases ward and four in convalescent ward and contact sheds.

As regards disinfection of clothes by sweepers previous to washing by Dhobies, the clothes are first dipped and well-washed with phenyle solution or perchloride of Hg. solution; then they are exposed to the sun and dried and afterwards given to Dhobies.

5. Water-supply is from the pipe.

6. The wards and other buildings are first wetted with perchloride of mercury solution (1 in 1,000). Then they are exposed to the sun and allowed to dry. They are afterwards swept properly. The walls and floor are then lime-washed, and carbolic powder is thrown about here and there.

Clothes were never sent to the Steam Disinfector. Phenyle, carbolic, iodine or permanganate of potash solutions were used for washing away any portion of the room soiled with foul excretions or dirt.

7. Dead bodies are carried in a coffin to the Borah Cemetery, situated rather behind, but more on the left side of the hospital. Bodies are besmeared with camphor and other solutions holding some incense, &c., in accordance with the usual Borah practice of disposing of the dead bodies. The mortuary is a large, open and wide space behind, but at a sufficient good distance from the hospital. Pauper patients after death were buried, like other ordinary burials, at the expense of Mr. Adamji Peerbhoy.

8. No inoculation was reported to have been done previous to admissions, except in a case of a Mahomedan male, aged 20, who had come to hospital from Dharavi. He was inoculated (but not in full dose) before he was attacked. The date of the inoculation could not be obtained. His attack ended fatally after four days. His name was Bahadur Khan Jeeva Khan. He was admitted on 6th November 1898 at 10 A. M., and he died on 10th November at 3 P. M. His left parotid gland was enlarged. It was informed that he was attacked four days before his admission. He was once in the hospital on 25th August 1898, and was discharged cured after 36 days on 1st October 1898. The enlarged gland was in the left loin.

9. There was no sickness or mortality in the regular staff of the hospital. Amongst contacts, there was an attack three days after admission of a female patient, aged 14. The attacked person was a male, aged 40, by name Rajbhai. He was the father of the above mentioned female. The daughter had developed multiple buboes, but she recovered while the father died on the fifth day of the attack.



TABLE I.—*Total Admissions during the year.*

Months.				Plague.	Relapsing Fever.	Observation Cases, including all General Diseases.	Total.
June	1898	...	...	3	...	2	5
July	"	...	...	5	...	...	5
August	"	...	...	7	...	3	10
September	"	...	...	12	...	2	14
October	"	...	...	10	...	1	11
November	"	...	...	3	..	2	5
December	"	...	...	3	...	...	3
January	1899	...	...	5	...	2	7
February	"	...	...	23	...	4	27
March	"	...	...	34	...	3	37
April	"	...	...	30	..	3	33
May	"	...	...	12	...	2	14
Total				147	...	24	171

11. The largest number of admissions during any week (from March 17th to 23rd) was 13, and on the particular day of February 8th, it was 5.

12. The total number of deaths during the year is 80. Total number of deaths from Plague is 74. Largest number of deaths on 17th April 1899 is 3.

Percentage of deaths to admissions, 98·6.

TABLE II.

—				Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague	...	...		147	74	73	50·3
Relapsing Fever	...	...		.....	.....	.....	.....
Observation & other diseases				24	6	19	24
Total				171	80	92	46·5

TABLE III.

Months.				Total Admissions	Died within 24 hours.	Within 48 hours.	Total deaths.	Total recoveries.	Percentage of deaths
June	1898	...	...	3	.....	1	1	2	33·3
July	"	...	...	5	1	2	4	1	80
August	"	...	...	7	3	.....	4	3	57·1
September	"	...	...	12	1	1	6	6	50
October	"	...	...	10	3	.....	6	4	60
November	"	...	...	3	.....	.....	2	1	66·6
December	"	...	...	3	.....	.....	.....	3	.....
January	1899	...	...	5	1	.....	3	2	60
February	"	...	...	23	2	3	12	11	51·7
March	"	...	...	34	5	4	17	17	50
April	"	...	...	30	4	1	14	16	46·6
May	"	...	...	12	2	.....	5	7	41·6

TABLE IV.—*For Borahs.*

Total admissions.					Deaths.	Recoveries.	Percentage of deaths.
Male ...	...	...	...	98	54	44	55.1
Female...	...	...	...	26	14	12	53.8
Children (under 15 years of age)				16	4	12	25.0

TABLE IV.—*For Hindoos.*

Total admissions.						Deaths.	Recoveries.	Percentage of deaths.
Male	...	...	...	...	4	1	3	25
Female	...	...	...	...	1	1	0	100
Children (under 15 years)					2	.....	2	.....

TABLE V.—*Table showing the mortality for the year amongst sexes and children.*

Total mortality for the year.	Mortality amongst the Men.	Mortality amongst Women.	Mortality amongst Children under 12.
74	55	15	4

TABLE VI.—*Table showing the situation of buboes.*

Situation.	Total No. of cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of Mortality.
Cervical ... ..	3	2	1	2	1	66·6
Parotid ... ..	3	3	.....	3	.....	100
R. Axillary ... ..	32	28	4	17	15	45·1
L. Axillary ... ..	16	10	6	11	5	68·7
R. Femoral ... ..	25	18	7	18	7	72
L. Femoral ... ..	20	15	5	10	10	50
R. Inguinal ... ..	26	21	5	4	22	15·3
L. Inguinal ... ..	14	11	3	4	10	28·5
*Other situations ... ..	3	1	2	1	2	33·3
No buboes ( <i>i.e.</i> only tenderness).	4	4	.....	4	.....	100
Multiple buboes ... ..	1	.....	1	.....	1	.....

\* In the popliteal space and 2 on the calves of legs and also in the groins.  
No pneumonic plague case.

In conclusion, I beg to offer my best thanks to the District Officer, the Chief Medical Officer and other superior Officers for kindly visiting the hospital and recording their very good opinions in the visitor's book both as regard the management of the hospital and the conditions of the patients.

D. R. KHOTE, B.A., L.M. & S.

*Medical Officer in charge.*

*Remarks by Special Medical Officer.*

A most useful and well conducted hospital.

## No. 12

**Report on the Hindu Fever (Plague) Hospital, Bombay,  
from 20th February 1899 to 31st May 1899.**

*The Office Bearers.*

Tribhuwandas Mangaldas Nathubhai, Esq.—President of the Managing Committee.

The Hon'ble Mr. Vijbhukandas Atmaram—Chairman of the Executive Committee.

The Hon'ble Dr. Bhalechandra Krishna } also Consulting Physician.

Janardan Gopal, Esq....	...	...	} Honorary Secretaries.
Rao Bahadur N. T. Vaidya.	...	...	
S. D. Khote, Esq.	...	...	
D. G. Padhye, Esq.	...	...	

Dr. G. B. Kher ... .. Honorary Chief Medical Officer.

Harischandra Pandurangji Pitale, Esq.—Treasurer.

M. R. Bodas, Esq.	...	...	} Auditors.
Gangadher Dewji, Esq.	...	...	

History of the foundation of the Hospital.

The Hospital was opened on the 28th January 1897. It came into existence as the outcome of the efforts of a meeting of leading Hindu gentlemen, held on the 13th January, at the house of Mr. Tribhuwandas Mangaldas Nathubhai, and presided over by him. A Committee of management was regularly organized, and Dr. (now the Hon'ble) Bhalechandra Krishna and Mr. (now Rao Bahadur) Narayan Trimbak Vaidya, were appointed Honorary Secretaries. The Hospital was first located at the Connaught Road on Municipal ground, and originally consisted of 6 sheds capable of accommodating 24 patients only. The Hospital soon got popular, and the number of patients seeking admission therein went on steadily increasing, so that the Committee thought it necessary to enlarge it by adding more sheds. By the end of May 1897, the epidemic of the year had practically become extinct, but as there were a number of convalescents in the Hospital unfit to be discharged, and as the desire for its continuance was expressed on all hands, the Committee resolved to continue it even during the monsoons. So they removed it to a large and spacious bungalow near the Grant Road bridge, rented at Rs. 175 per mensem, which amount was subsequently increased to Rs. 210. The Hospital continued in this bungalow till the end of May 1898, when it was temporarily closed, no need appearing for keeping it open. It was re-opened on the 20th February 1899, and was shifted to the Churni Road Gardens, a large and central portion of which was kindly placed at the disposal of the Committee, for the purpose, by the Plague Authorities, who also gave material help in other directions. The Hospital is kept still working, three of the sheds having been made weather-proof and fit to receive patients even in the monsoons.

The Hospital has been maintained entirely by private subscriptions and donations. A list of the principal subscribers is given in Appendix A. The help to the hospital has mostly come in the shape of monetary donations. There have, however, been contributions in other shapes, out of which special mention needs be made of two semi-permanent sheds with corrugated iron roofing and dealwood walls, each 24 by 40 feet, lent by Messrs. Thackersey Moolji and Sons, and of the services of an European nurse (for three months) given by Mr. Damodar G. Sukhadvala.

\* Members of the Executive Committee.

† Added in 1899.



The services of the Hospital have been appreciated not only in Bombay but also far and wide, and, as a proof of this, it might be mentioned that substantial monetary help has been given to the Hospital by His Highness the Maharaja Gaikwad, the Raja Sahib of Jawhar and the Chiefs of Miraj (senior), Jechalkaranji and Vishalgad.

The Committee of Management originally consisted of 15 members, with Dr. Bhalechandra and Mr. N. T. Vaidya as Honorary Secretaries. In April 1897, four gentlemen were added to the Committee, and Mr. Janardan Gopal to the Secretaries. There was a still further re-organization in the beginning of the current year, several gentlemen having been added to the Committee, and Messrs. S. D. Khote and D. G. Padhye to the Secretaries. An Executive Committee was nominated out of the members of the Managing Committee so enlarged, Mr. Tribhuwandas Mangaldas Nathubhai being selected the President of the latter, and the Honourable Mr. Vijbhukandas Atmaram, the Chairman of the former. The names of the gentlemen of the two Committees are given in Appendix B.

The hospital has been all along conducted on a non-sectarian basis, and has drawn its funds from representative members of almost all the leading Hindu communities of Bombay. Many communities have depended on this hospital alone and helps have also come from some communities, as a body. Special mention may be made of the Soma Vansia Ksatriya, a community which paid about Rs. 1,600, and of Messrs. Devidas and Ranchoddas Vrandavandas Purshotumdas, who paid on behalf of the Bhansali Community to which they belong Rs. 1,000 towards the funds of the Hospital.

The names of the Committee are given in Appendix B.

#### *Medical Officers.*

The Honourable Dr. Bhalechandra Krishna Bhatwadekar, L. M., Honorary Consulting Physician.

Dr. Govind Balaji Kher, L.M. and S., Honorary Chief Medical Officer.

Mr. Parmodrai Ishvarrai Divatia, Resident Medical Officer.

During the temporary absence of Dr. G. B. Kher for about 15 days, Dr. R. N. Parmanandas, L.M. and S., and Dr. S. B. Naik, L.M. and S., acted as Honorary Chief Medical Officers. The Medical Staff consisted of one European Nurse named Mrs. Ford, one Hospital Assistant, two compounders and one dresser. Besides there were 15 ward boys, 4 ayahs, one store-keeper, one cook, two general servants and one dhobie, two Ramoshis for day and night duty, and 6 bhangis, 3 males and 3 females were kindly lent by the Municipality.

Among the donations to the hospital, special mention might be made of the munificent contribution of Rs. 4,450, received from Mr. Tribhuwandas Mangaldas Nathubhai. At a meeting held under his presidency, at which the idea of starting the hospital originated, he kindly came forward and offered to make up any deficit that might arise in the accounts, but eventually the sum to be paid was fixed at Rs. 5,000 of which he has up to date paid Rs. 4,450.

The best thanks of the Committee are due to him for this generous help, and they have expressed them in suitable terms.

3. The Hindu Fever Hospital is located in the Charni Road Gardens, on the seashore called the Back Bay. The site is the best one in Bombay, being directly open to the sea-breezes, and the soil being sandy and thoroughly dry. The space between the gardens and the sea is unoccupied, and is only resorted to by a portion of the

fashionable public who are accustomed to go out for an airing. The gardens are bounded on the other side by the B. B. & C. I. Railway Line and the Charni Road Station of the same Railway Company.

The hospital consists of five sheds, three of which are semi-permanent structures ; and the remaining two are temporary ones. The two temporary sheds, each measuring 32' by 24', are constructed of bamboo-mats and cadjan with a plinth of one foot and lime-washed ceiling, and each of them can accommodate 8 beds. One of the sheds was also lime-washed externally, in order to protect the occupants effectively from the outside heat.

Two of the semi-permanent sheds, which are the gift of Messrs. Thakersi Moolji & Sons, have planked walls and corrugated iron-roof, with one foot plinth, and each measuring 40' by 24'. The corrugated iron roofs are covered with cadjan as a protection from heat. The wards are fitted with large windows and wooden flaps next the floor. Each of the sheds is divided into three compartments, and each compartment can accommodate 6 beds. The floor as well as the walls were lime-washed from time to time. The third semi-permanent shed is constructed on the Swiss cottage principle, which has been very much approved of late by the Authorities. It measures 35 by 16', and has got a high plinth measuring two feet and-a-half. When the windows are closed they stop the breeze completely without disturbing the ventilation. The hospital can accommodate nearly 60 patients in all. One shed measuring 24' by 24', with a verandah of four feet, accommodates the office and the dispensary. Quarters are provided for the Nurse, the House Surgeon, the Hospital Assistants and Compounders. Two sheds each measuring 40' by 14' with a verandah of 4 feet are set aside for contacts. Each of these consists of 4 rooms. They give accommodation to nearly 30 persons. A separate shed is provided for the kitchen and the stores, and the blangis are provided with quarters in a separate shed.

4. There are latrines with five seats provided by the Municipality. They are used by the Hospital servants and the contacts. They are kept clean and disinfected with phenyle solution and sanitas powder. The night-soil is carried to the depôt by a bhangi, and the sullage water for which a cesspool has been built is taken away in a Municipal cart.

The patient's excreta were collected in bedpans ; a small quantity of some disinfectant, such as Chloride of Lime, Iodine Perchloride solution, was put in each pan before use. After use the pan was taken out of the ward and emptied in a basket kept specially for the purpose of collecting the patients' excreta which was ultimately taken to the depôt.

The clothing, blankets, and other articles of the sick persons are disinfected by steeping them in boiling water for nearly 12 hours, and then they are kept in a large cask containing Hydrargyri Perchloride solution for 6 hours. They are then dried in the sun and handed over to dhobie for washing.

5. The water is supplied by the Municipality from pipes laid by them.

6. The walls, floor, and ceiling of the wards are first of all disinfected with Hydrargyri Perchloride solution and then washed with chunam. The floors of the wards are paid particular attention, and they are frequently lime-washed and Chloride of Lime and Dry Chunam was sprinkled over them. The disinfectants generally used in this Hospital are Phenyle, Iodine Perchloride solution, Chloride of Lime, Sanitas powder, and Carbolic and Hydrargyri Perchloride solution of the strength 1 in 1000.

The clothes of the patients are disinfected in the premises of the Hospital compound and they are not sent to the disinfecting station.



7. On the death of a patient, the body was removed at once to the mortuary for which a temporary shed was erected in the premises far away from the wards. There is an independent out-going passage from the mortuary away from the wards and the main road, so that no patient could observe the taking away of the corpses. The mortuary could admit light, but not crows or other birds. The bodies were kept in galvanized sheets separated from each other so that caste prejudices could be preserved. The floor was kept clean, and was thoroughly disinfected as often as necessary with Chloride of Lime and Phenyle. The dead body was never allowed to remain for more than a few hours. The corpse was wrapped in a sheet soaked in Perchloride of Mercury solution, and then handed over to the friends or relations for being taken to the cemetery. With regard to the bodies of the pauper patients when they happened to be Brahmins, the Brahman Community had made their own arrangements for removal and disposal. When the bodies happened to belong to other castes, without any friends or relatives to take care of, they were disposed of by Mahratha servants of the Hospital in a hand cart with springs specially presented for the purpose by Sheth Damordur Goverdhandas Lukhadwalla, the expenses being borne by the Hospital.

8. Of the cases admitted into the hospital, information in regard to their being previously inoculated with Haffkine's serum was obtained in only 2 cases. The exact date of their inoculation is not known, but it was ascertained, when they were living in the Hospital, that the inoculation had been done during the previous year and not this year. One of them died and one has recovered.

9. Amongst the staff of the hospital only one person suffered from plague. He was a ward boy coming to the hospital premises only for his duty. He must have got the infection in the town, at his residence on Tardeo Road, where some of his neighbours had died of plague. He died four days after the infection.

A clerk in the Municipal service at the Sonapur cemetery, who served at the hospital during 1897 and 1898 as a clerk, was infected about a month after the opening of the hospital. Though he was in no way connected with the present hospital staff, he volunteered his assistance to the staff during his leisure and on that account he was often allowed to live on the premises. As regards the source of the contagion, nothing definite can be said as he worked at the Sonapur cemetery for nearly ten hours every day, and was not bound to stay on the premises of the hospital. The only thing that could be ascertained about his case was that he must have been infected through the cracks on the soles of his feet because it was observed that he was always in the habit of walking bare-footed. Under these circumstances, it is much more likely that the source of his contagion must be outside the hospital premises, particularly because great care was taken to thoroughly disinfect the wards, the latrines, the clothes, the beddings and blankets of the patients, as often as necessary. In fact no possible source of contagion was left uncared for, and no other member of the staff living on the premises had any sign of the contagion during the whole period.

TABLE I.

10. Total admissions during the year 1899.

Months.	Plague.	Relapsing fever.	Observation cases including all general diseases.	Total.
February ... ..	25	Nil.	1	26
March ... ..	131—2=(129)	"	2	133—2 (131)
April ... ..	79	"	1	80
May ... ..	17	"	9	26



Of 252 admissions, 250 were treated in the hospital. In the month of March one patient absconded and died ultimately in the Colaba Hospital, and one was transferred to Vaishnya Hospital, 3rd Bhoiwada, Bhuleshwar.

11. The largest number of admissions was 42, and it was during the 4th week of March 1899.

The largest number of daily admissions was 11, and it was on the 23rd March 1899.

12. The total number of deaths during the year was 198, of which 194 were from plague.

The percentage of mortality was 75 to the total admissions 263.

The largest number of deaths was 6.

TABLE II.

	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague ... ..	250	194	56	77 per cent.
Observation and other diseases...	13	4	9	30 „
Total ...	263	198	65	...

TABLE III.—*Plague.*

Month.	Total admissions.	Died within 24 hrs.	Died within 48 hrs.	Total Deaths.	Total Recoveries.	Percentage of Deaths.
February ... ..	25	5	<i>Nil</i>	20	5	75 per cent.
March ... ..	129	65	5	99	30	49 „
April ... ..	79	35	20	60	19	20 „
May ... ..	17	8	2	15	2	71 „

The total percentage of mortality excluding the deaths within 24 and 48 hours was 49 as will be seen from the above figures.

TABLE IV.

	Total admissions.	Deaths.	Recoveries.	Percentage of Death.
Males... ..	148	124	24	82
Females ... ..	77	51	26	66
Children ... ..	28	23	15	60

The above table includes only Hindoos of all castes except Bhangis, Dheds and Mahars.

TABLE V.—*Table showing the mortality for the year amongst sexes and children.*

Total mortality for the year.	Mortality amongst the men.	Mortality amongst women.	Mortality amongst children all under 12 years of age.
198	124	51	23

TABLE VI.—Table showing the situation of Buboos.

Situation.	Total number of cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of Mortality.
Cervical ... ..	11	6	5	7	4	63 per cent.
R. Axillary ... ..	32	18	14	27	5	84 do.
L. Axillary ... ..	20	11	9	18	2	90 do.
R. Femoral ... ..	37	24	13	28	9	75 do.
L. Femoral ... ..	40	35	5	30	10	75 do.
R. Inguinal ... ..	28	24	4	21	7	75 do.
L. Inguinal ... ..	25	16	9	18	7	75 do.
No buboes ... ..	35	21	14	35	Nil.	100 do.
Multiple-Buboes ... ..	22	11	11	10	12	45 do.

TABLE VII.—Table showing Pneumonia Plague (without Buboos.)

	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	6	2	4	33 per cent.
Females ... ..	Nil.	Nil.	Nil.	Nil.
Children ... ..	.....	.....	.....	.....

TABLE VIII.—Table showing cases of secondary Plague-Pneumonia (complicated with Buboos.)

	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	6	5	1	83o/o
Females ... ..	4	2	2	50o/o
Children ... ..	Nil.	Nil.	Nil.	Nil.

The cases were diagnosed by the appearance of the signs and symptoms of Pneumonia, developing on the 4th or 5th day of the disease. In one or two cases it developed on the 6th day. No Bacteriological examination was made.

*Notes on the symptoms and character of the disease:—*

The disease generally commenced with various symptoms which at the start might lead to its being confounded with different affections, such as intermittent or remittent fever of a malignant type. The symptoms varied much according to the severity and the type of the disease. In most cases when the epidemic was at its height, the disease began without any marked premonitory symptoms except a slight rigor and sensation of heat. If premonitory symptoms occurred, these generally lasted

only a few hours or for one or two days. They were generally violent, dull headache or sometimes heaviness of the head and temples, loss of appetite, sense of oppression in the chest, lassitude, nervous depression, dull pains all over the body and specially about the groin and in the lumbar region in some cases. There was nausea often vomiting and constipation. In the stage the temperature did not seem to rise, or if it rose the rise was very little. Many persons, generally the lower class people with their proverbial ignorance, used to ascribe all these symptoms to an attack of bile caused by some irregularity in diet or to change of season, and on this belief, they remained without any systematic treatment. Two or three days after, when the illness assumed a grave aspect, and was marked by high continued fever and glandular swelling, the proper medical and hygienic treatment was tried to be given to the patient. This stage of attack during the height of the epidemic usually lasted but a few hours, and was soon followed by high fever and great constitutional disturbance. There was great muscular and nervous exhaustion and an over-powering sensation of fatigue. The illness being only of one or two days' duration, the patient not expecting that his strength should fail him so soon, naturally tried to exert himself, but to his utter despair and surprise he used to find that he was unable to walk or even to stand for a few minutes. When he tried to walk in a particular direction, general trembling set in, and he was inclined to fall down. The patient showed a gloomy expression of countenance which appeared to be somewhat characteristic of the plague. The face appeared a little swollen and suffused and the skin around the eyes, the forehead, and the cheeks assumed a bluish, black or muddy aspect. The eyes were observed to be glowing and injected, sometimes blood-shot and a little retracted. The look was generally vacant, anxious, stupid, sometimes fixed and idiotic. This singular expression though somewhat diagnostic of the plague did not always indicate the gravity or seriousness of the case. Frequently, in addition, the speech was thick, faltering and indistinct. The voice when affected was generally husky and low. These two signs when present, always indicated a bad prognosis.

The intellectual power and the senses usually became dull, and there was generally insomnia of the most distressing character. Sleeplessness is one of the earliest symptoms and is present for days and nights in succession in worse cases. If a patient sleeps well and naturally, it must be considered a favourable sign. During the disease, at the commencement the patients were generally quiet, apathetic, but as the fever rose high and the sensation of internal heat and distress became extremely unbearable, they threw themselves restlessly from side to side and became delirious.

The delirium was found to be a common symptom in patients admitted into this hospital. It was usually of a muttering character, the patient was seen moving his hands to and fro and sometimes picking the bed clothes.

In a few cases it was of a violent kind. The patient was sleepless, rolled his head about, cried out loudly, tried to spring from the bed and run away. Such patients refused all nourishment, and were restrained with great difficulty. This form was seen usually in young and strongly built muscular patients.

The symptoms of disorder of the digestive tract were as follow :—

At the onset of the disease the tongue usually became bright red at the tip and edges, and is covered with a white fur. Later on it becomes dry, cracked and covered, together with teeth and lips with brownish incrustation resembling the tongue seen in third week of Typhoid fever. The mucous membrane of the mouth and pharynx is sometimes red and inflamed which is generally found to be an unfavourable symptom. The appetite disappeared. Vomiting is generally found



to be present and uncontrollable in the beginning of the attack. It is generally bilious or watery, and continuous and obstinate in some cases. Great thirst with a painful burning sensation in the stomach is usually present. Hæmatemesis was not observed.

The liver and spleen were also found to be enlarged and painful in few cases. The bowels are usually constipated and require to be kept open by internal medicine or enema.

Diarrhœa was rarely seen to continue throughout the whole period of the fever.

*Disorder of the respiratory system.*—Patients with the various signs and symptoms of plague enumerated above, excepting the bubo, and with prominent symptoms of affection of the respiratory organs, were observed in the Hospital, and these might be called the cases of the Pneumonic type of the plague. These cases were rather difficult to be diagnosed in the early stage from cases of true croupous pneumonia, but the diagnosis was helped greatly by the absence of the most characteristic signs such as marked dullness, crepitations, &c., of the latter in cases of plague and in such cases further confirmation might be obtained by a microscopic examination of the sputum.

In some cases congestion, bronchial catarrh, and pneumonia appeared as complication of the disease.

The breathing was frequent generally in proportion to the height of the fever, but in some cases it was unusually hurried without any obvious lung complication to account for it, and such cases as a rule terminated fatally.

*The Pulse.*—At the beginning of the disease it was full, soft, bounding and frequent, varying from 100 to 130 according to the intensity of the fever. But soon after, within the 3rd or 4th day of the illness, it used to lose its tone and become unsteady, feeble, small and frequent, which surely indicated that the case was getting worse and would soon end unfavourably. A gradual fall in the frequency of the pulse rate is a favourable sign. It was also observed that the cases in which the pulse remained steady and proportionately slow, even when the temperature rose high, generally recovered. The heart's sounds were generally found to be normal although the impulse was diffused.

*Disorders of the nervous system.*—There were muscular twitchings, partial deafness, insomnia of the most distressing character, nervous exhaustion and delirium as described above. One prominent symptom worth observing was the marked loss of muscular co-ordination evidenced by the clumsiness with which the patients handled the articles ; their way of speaking and their inability to walk.

*Fever.*—It was present in almost all cases, but varied much in height and duration. No regular typical curve like that of some specific fevers was observed. It was usually ushered in by one or more fits of shivering. The temperature ranged generally between 103° and 105°F. But in a few cases, after the first rise to 105° or to 107° even, it ranged from 100°F to 103°. The temperature began to rise on the first day and attained its height on the second or third day, when delirium usually set in. The temperature continued to be high with slight remissions till the end of the first week. Then in successful cases it steadily began to go down from the end of the first week, to the middle of the second week, when it became normal and continued so in uncomplicated cases ; whereas, when serious complication was present, it progressed according to the nature of the complication. A fall of temperature by lysis from the 5th to 7th day is a favorable symptom.

The height of the temperature afforded no certain criterion of the severity of the cases, and though the temperature seemed to keep down low, it was not safe to give a favorable opinion, because of its abatement, as patients with high and low temperatures were seen equally to succumb to the disease.

*Bubo.*—The most characteristic phenomenon of the disease was the swelling of the lymphatic glands. It appeared either at the beginning of the fever or much more commonly in the course of the first 4 or 5 days of the disease. The percentage of cases treated in the hospital in which it was present was 86. It appeared in one or more parts of the body, and varied in size from a bean or small almond to that of a hen's egg.

The size and situation of the bubo, though not sure indicative of the gravity of the case, affected its course to a considerable extent. It was observed that the smaller and more tender the bubo was, and attended with high pyrexia, the greater was the danger, while an early appearance of the bubo and its early inclination to suppurate were looked upon as favourable symptoms.

The bubo developed itself frequently about the groin and the femoral region. It also developed in the armpit, the angle of the lower jaw and the neck. In exceptional cases it was found in the side of the chest and the elbow joint. As a rule it appeared in one of these places only, but in few cases it appeared simultaneously in more than one place.

It might be either superficial and palpable, or internal, or a combination of both. Amongst the internal glands, those of the intestines were chiefly affected as could be made out by the abdomen being very tender in such cases.

In 215 cases in which the bubo made its appearance, it was localized as follows:—

Femoral	77.
Inguinal	53.
Axillary	52.
Cervical	11.
Multiple	22.

*Character of the Bubo.*—The affected gland was swollen and increased in size and was always tender and painful, so much so that even when the patient was comatose, moderate pressure on the gland caused moaning, indicative of the suffering produced thereby.

As the disease progressed, the bubo got inflamed and there was a marked infiltration, hæmorrhagic or serous, in the glandular and cellular tissue surrounding it.

The inflammation was not confined to the single lymphatic gland first affected, but it spread usually to the neighbouring glands also. The skin over the bubo then became red and œdematous and a hard painful swelling was thus formed. In the cases that recovered, the bubo suppurated, and when opened it gave out pus and other inflammatory discharges. It usually suppurated from the 10th to the 14th day of the illness, and it required generally one or two months to heal completely.

#### *Complications.*

*Brain symptoms.*—Congestion was found to be very common as was evidenced by the presence of delirium in many cases. True meningitis was observed in only two cases of children, both of which proved fatal. On account of the toxæmic condition of the blood, the intellectual powers appeared to have become dull, but in most of the cases no symptoms indicative of any organic lesion in the brain were seen except in cases where speech was affected. However, when the patients became convalescent, the power of speech was restored.



*Suppression of urine*.—It was found in three cases only, but the urine, however, in most cases was scanty and high colored.

*Bowels disturbances*.—Diarrhoea was met with in only one case which ultimately proved fatal.

*Hæmorrhage*.—It was generally found from the lungs and not from other organs. It occurred in about 8 cases, of which 2 recovered and 6 proved fatal.

*Pregnancy*.—Three pregnant women were admitted, one was at the 3rd month and she recovered without abortion having taken place, two were advanced in pregnancy and both of them aborted and died.

*Menstruation*.—One girl of about 14 years of age, admitted into the hospital for plague, menstruated for the first time during the continuance of the disease. The case proved fatal.

*Eye*.—Conjunctivitis with ulceration was seen in two cases, one of them recovered and one died.

*Ear*.—Deafness was present in some cases, but the patients used to understand questions when they were spoken to loudly and distinctly. This symptom must probably be due to the dullness of the mental faculties.

Otorrhæa was seen in one or two cases only.

*Sequelæ*.—In two cases the power of speech is not yet completely restored. The speech is still indistinct. In one case there was marked loss of muscular co-ordination, and though the patient has recovered, the power of co-ordination in the extremities is not yet completely restored.

*Period of convalescence*.—The convalescence usually set in by the end of the first week or 10 days; but the recovery was not complete until one or two months had elapsed.

A case of mumps mistaken for plague was not observed in the hospital.

The total number of cases kept under observation was 13, and the diseases which they developed were as follow :—

Disease.							No. of cases.
Pneumonia	...	...	...	...	...	...	3
Gangrene	...	...	...	...	...	...	1
Measles	...	...	...	...	...	...	1
Remittent Fever	...	...	...	...	...	...	8
							<hr/> 13 <hr/>

*Treatment*.—The plague being a very acute affection and running a very rapid course, it should be remembered that the sooner the treatment is adopted the greater are the chances of recovery.

The treatment of plague cases is mainly of three kinds :—Remedial, Hygienic and prophylactic. But as required in the questions, I shall confine my remarks only to the remedial and the Hygienic part of the treatment.

*Remedial*.—Now it has been proved that the plague is a bacillary disease propagated and diffused by a specific micro-organism, and that its effects are due to the operations of the same specific micro-organism that has infected the body. Having entered the human body either through the respiratory organs, or the skin or the intestinal tract, it multiplies readily in the blood, and the system being thus poisoned, the disease manifests itself in one form or another according to the virulence of the poison and the state of health of the person affected.



Bearing in mind this nature of the plague, the rational indication for treatment to eliminate the toxin, or to neutralize in whatever way we can, the morbid activities of the special microbe with which the organism has been infected. This was tried to be achieved by means of antiseptics or germicides.

The chief germicide used was Liqr. Hydrargyri Perchloride given in 3s.—3i. dose, six or eight times during twenty-four hours. It was generally combined with stimulant diaphoretics and cardiac tonics.

Another germicide that was much used this time was a combination of Iodine and Chlorine in certain proportions. Every one admits that Iodine and Chlorine stand very high in the list of drugs possessed with germicidal power. The chief difficulty was, how to give them in a suitable form in a quantity sufficient to neutralize all the toxins and germs in the blood, without the least chance of doing any injury to the tissues and organs, through which they were introduced into the system. Ultimately a combination in the form of Terechloride of Iodine was prepared with varying proportions of Chlorine, added to it to make it stable, and was tried in good many cases in the hospital. That this preparation has a marked effect in destroying the germs of Typhoid fever, Cholera and other diseases, and that it is not poisonous has already been shown by Tranggott and Professor Behring by experiments made on hospital patients. First it was administered in 10 to 20 minim dose frequently repeated, but later on it was given from 3s. 3i. per dose largely diluted with water.

Some patients could bear it very well, while others vomited as soon as it was given. No evil effect was seen in a single case. The results obtained are no doubt hopeful and beneficial to the extent of 50 per cent., but they cannot yet be declared as conclusive as other drugs were also given to the patients to whom Iodine Terechloride was administered.

A germicide can possibly be of use only when it is given from the very commencement of the disease. It is of no use expecting any marvellous result from it when the disease is sufficiently advanced. It cannot be expected to repair the mischief already done to the system by the bacteria and their products.

I must here express my sincere thanks to Professor T. K. Gujjar, for suggesting to me this drug as powerful germicide, and supplying it to the hospital at his own expense.

On admission the patient was undressed, the personal clothing was removed, and the body was carefully sponged over with warm water containing Condy's fluid. He was then given new clothes and put into a fresh bed in the acute ward.

When the admitted patient was first examined in the hospital, the foul state of the tongue, and the foul breath usually present in plague cases, suggested the use of a purgative, and this was done by means of calomel in 5-grain doses at bed time, and followed by a saline purge, if the bowels did not move freely by it. I think calomel is best suited for this purpose on account of its antiseptic and purgative property, as it sweeps the intestines clean of decomposing ingesta and of putrid bacteria that may be present there. Free action of the bowels was necessary to expel poison from the system, and this was seen to do some good as it frequently stopped the vomiting and enabled the patient to take his nourishment with better relish than previously.

Another chief indication is to maintain the patient's strength and to support the constitutional vigour so as to help the system to resist the toxic influence of the infective products of the plague bacillus. It is of the greatest importance that the

patient should be kept absolutely at rest in bed, from the commencement of the fever. He should not be allowed to get out of bed for any purpose, and hence the use of the bed-pan and urine bottle should be insisted on.

Many persons not knowing the importance of absolute rest in such cases used to shift the patient from one place to another for fear of his being detected and removed to a Hospital. But it should be borne in mind that the fatigue of physical exertion caused by such stealthy shifting from place to place is very great and disastrous in effect.

The next point in connection with the maintenance of the patient's strength is the regulation of food and drink given to him. In acute cases, rice and sago conjee, milk, tea, and fruits were given. The food should be of the bland and most digestible and nourishing character. It should be given in small quantity and at stated intervals, irrespective of the desires or the inclination of the patients in the matter. In treating Hindu patients, main reliance had to be put on milk as the most nourishing article of diet. During the acute stage all meat preparations were prohibited on principle, though they could be used in persons of certain caste who had no religious objection to their use. They were used after the acute stage had passed according to the necessity of each case.

It has been assumed by many practitioners that milk may be given *ad-libitum* as much as the patient can take without bad effects. But it should be remembered that injection (taking in) and digestion are very different things. The physician should satisfy himself that the milk in the quantity taken by the patient is being digested by him and is not producing any bad effects by way of restlessness, flatulence, &c.

To convalescents, ordinary diet consisting of rice, dal, ghee, vegetable and milk was given if his caste prejudices admitted of this.

*As regards drink.*—The patients were allowed to have a reasonable quantity of barley water, soda water or if they objected to it, pure water. If the thirst was excessive ice was given to suck.

*Stimulants and cardiac tonics.*—The heart seems to be very early affected in this disease as indicated by the weakness of the first sound, and the pulse being small, frequent soft and wanting in tone.

As general muscular relaxation and nervous exhaustion were prominent features of the plague, the condition of the heart required a careful watch from the very commencement of the fever, for the cause of death in the majority of cases was failure of the heart.

This circumstance calls for an early administration of stimulants and cardiac tonics in addition to the other measures taken to support the strength.

The stimulants and cardiac tonics used in the hospital were chiefly Ammonii carbonas, ether, cinchona, digitalis, strophanthus, nux-vomica, and alcohol in the form of rum or spirit Vini Gallici. Rum was used freely with medicine as well as with milk. When the patient was found to be very low and the stimulants given internally by the mouth were not likely to be absorbed into the system and prove effective, strychnia was used hypodermically as the best stimulant.

As many patients admitted in the hospital were in the advanced stage of the disease, the administration of stimulants by the mouth was not much depended upon, and so strychnia was injected twice or even thrice a day in some cases. It may be noted here that plague patients can tolerate proportionately large doses of strychnia and liq. hydrargyri perchloridi, and it might be true also of other drugs.



Strychnia has been found to keep up the tone of the pulse and the system generally by acting as a stimulant in many cases. But after a certain stage of the disease was reached, when circulation and respiration show signs of gradual failing, it is observed in some cases that the strychnia injections do not prevent further failure of the heart though repeated almost every 4th hour.

Another symptom which required special attention was fever. The rise of temperature in plague cases was looked upon not as the disease itself, but as a sign of the intensity of the activities of the infective agent, and so the reduction of temperature by means of depressing antipyretics such as antipyrine, phenacetine, &c., under which the temperature is lowered down several degrees for a few hours only to rise again, was not attempted. When the temperature was below  $103^{\circ}$ , nothing special was done to lower the temperature except ice to the head, sponging the body with tepid water, and the use of antiseptics and stimulant diaphoretics internally.

But when the temperature rose and kept above  $104^{\circ}$  F. with but very slight remissions and the ordinary treatment by antiseptics, as mentioned above, failed in effecting a reduction, other means were employed to reduce the hyperpyrexia.

They usually consisted of the application of cold to the body in various ways, such as ice bag to the head, sponging and wet pack. These measures were useful not only for reducing hyperpyrexia, but also the nervous excitement and exhaustion attendant on it.

The fatigue attending these operations was not to be overlooked, and so brandy and milk were given before and after the operation.

Another symptom which required prompt treatment was vomiting. When it was persistent and severe it was generally looked upon as an unfavourable sign, as loss of strength ensued owing to the rejection of food and medicines. Mustard plaster to the epigastrium, ice to suck, and an effervescent draught with liquor morphinae hydrochloratis were generally found sufficient to check it.

The last symptom which required to be attended to was the glands. When the gland was inflamed and painful, belladonna with glycerine or unguentum hydrargyri or strong liniment iodi was applied, and to relieve pain it was fomented with warm linseed poultice. When the gland was ripe and formed into an abscess, it was opened and dressed daily with iodoform 'boric acid' and carbolic oil.

*Sleeplessness.*—It was combated by potas : bromide and hyocyamus. But in many cases morphia with atropine was used hypodermically at bed time, and it generally succeeded in bringing on sleep and making the patient quiet. In some cases when the patient was very violent and had no rest for hours together the injection was repeated every eighth hour, and it was attended with good results.

For delirium attended with red eyes, blister to the nape of the neck was found very useful in restoring consciousness.

#### *Hygienic Treatment.*

Attention to the laws of hygiene is necessary and important not only for the welfare of the sick and the convalescent, but also for the welfare of those who are as yet in the enjoyment of good health. When we know that persons suffering from diseases much less virulent and infectious than the plague, require to be placed in good hygienic conditions for their recovery, it cannot be doubted for a moment that these conditions are essentially necessary in cases of plague, for it is almost certain that its



epidemic occurrence is materially influenced by conditions, such as filth, over-crowding, &c., and it not infrequently happens that it is to good hygienic measures and proper nourishment, rather than to the administration of several drugs, that we do look for the cure of our patients.

Drugs no doubt have a value, and a considerable value in plague cases, but it is limited, and beyond that limit it is not possible to go. Recovery in plague depends much on the original constitution of the person and the nerve stamina in him.

No case in the Hospital was subjected to the treatment by the curative serum of Roux and Lustig.

G. B. KHER, L.M. & S.,

Bombay, 3rd August 1899.

Chief Medical Officer, Hindu Fever Hospital.

**Notes by  
the Special  
Medical  
Officer.**

The Committee and the Medical Officer are to be congratulated on the success of their undertaking. The hospital and its surroundings were always conducted on the most satisfactory manner. The whole buildings were compact, and no expense of trouble was spared to make the patients comfortable and happy. It was always great pleasure to me to visit this and the adjoining hospitals, as any suggestions I made were invariably carried out and welcomed. Rao Bahadur Naraen Trimbuck Viadya was indefatigable in the way he worked for the good of the hospital and camp, and I cannot thank him too much for the support he always gave me.

No. 13.

### The Pathare Prabhu Fever Hospital.

Dr. A. V. Velkar, L.M. & S. ...	...	...	{ Chairman and Honorary Chief Medical Officer.
Dr. V. S. Trilokekar, L.M. & S. ...	...	...	{ Members of the Committee and Hon. Medical Officers in charge.
Dr. S. B. Nayak, L.M. & S. ...	...	...	
Dr. A. P. Kothare, L.M. & S. ...	...	...	
Mr. S. B. Dharadar (Senior Medical Student)...			Honorary House Surgeon.
Atmaram J. Kirtikar, Esq. ...	...	...	Honorary Secretary.
Anandrao Hurrishankar, Esq. ...	...	...	Honorary Treasurer.

1. This Hospital, situated in the Churney Road Gardens, was re-opened on the 21st December 1898.

**History of the  
Foundation of  
the Hospital.**

2. It had been opened, with the sanction of the Plague Committee, in Churney Road Gardens, on the 10th February 1898, with a view to encourage timely removal of plague patients belonging to the community, in the interest of the sick as well as that of the healthy, a provision having also been made for locating the latter.

Ever since its establishment in 1898, this Hospital has been maintained with the help of funds contributed by the members of the community.

It has also been under the active management of the abovenamed medical gentlemen who all belong to the Pathare Prabhu community, and have volunteered their services with desire to help the afflicted and alleviate their sufferings.

**Subordinate  
Hospital Staff.**

The subordinate hospital staff, since December 1898, consisted of one resident compounder and three ward boys. Native nurses were engaged from time to time as required.

Besides the above paid staff, voluntary services were rendered by the following members of the community :—

Mr. V. A. J. Kirtikar, Junior Medical Student.  
 „ S. N. Navalkar, Honorary Chief Superintendent.  
 „ A. S. Nayak.  
 „ S. R. Dhairyawan.  
 „ R. D. Kirtikar.

Messrs. N. V. Dhurandhar and A. R. Ranjit also acted as volunteers for some time.

**Description  
of Hospital  
Buildings, &c.**

The hospital is situated in the Churney Road Gardens. It consists of two Acute Wards, two Observation Wards, one Convalescent Ward and one Dispensary.

All the above wards are pukka built, consisting of plank partitions and so constructed as to afford free light and ventilation. The Acute and Observation Wards are large enough to accommodate 12 patients at a time while in the Convalescent Ward there is an accommodation for 12 patients besides.

Attached to the hospital and close to it are contact and segregation camps.

The contact camp, intended especially for those who attend on the plague patients, consists of a block of six rooms (*vide* plan) enough to accommodate about 50 persons.

The segregation camp was intended for families who were removed from houses where plague cases actually occurred, even though the persons attacked did not actually belong to those families. This camp consists of 2 blocks each of 6 rooms (*vide* plan) enough to accommodate 60 persons.

Besides contact and segregation camps, the Hospital had this year attached to it two health camps, one on the Marine Lines and the other between the Churney Road and Marine Lines Stations, for the use of such members of the Patilare Prabhu Community as required immediate removal from infected localities. And the Committee is glad to say that it is on account of this valuable and timely addition to the hospital, that the number of patients admitted this year was very low as compared with the number admitted last year, and this in spite of increased virulence of plague this year throughout the city and especially in localities occupied by the members of the community.

In the opinion of the Medical Staff, even this number would have been still lower if the members of the community had taken due notice of the warning and listened to the advice regarding the timely removal to health camps, given to them long before the last recrudescence of the epidemic.

**Conservancy.**

Attached to the Hospital, contact and segregation camps, there were five latrines besides the urinals, and these were connected with masonry built cesspools which were cleaned every morning and evening by bhangies attached to the hospital. Special care was taken to keep them quite clean and disinfectants were freely used.

**Water-supply.**

Two taps were supplied within the compound by the plague authorities.

**Disinfection  
of Wards, &c.**

Utmost cleanliness was observed in wards. Floors and walls were constantly lime-washed, strong solutions of perchloride of mercury or phenyle being added to the lime-wash. Carbolic powder was also used for sprinkling over the floors. Besides the above disinfectants, lysol solution was also used for washing hands, &c.

Sputa and excreta were thoroughly disinfected, and all the dressings and highly infected clothing removed from the patient immediately after admission, were burnt. The hospital clothing used for a plague patient was, immediately on removal, first kept

by the bhangies, at least for 48 hours, in a tub containing saturated solution of perchloride of mercury, and then washed with sea-water. The clothing was subsequently handed over to the dhobie attached to the hospital for final washing. Special care was taken to see that every article of clothing was put in a "*Bhutti*" constructed for the purpose close to the hospital, with a view to subject it to a high temperature.

Disposal of the dead.

In each and every case immediately after death, the body was wrapped in a sheet saturated with a strong solution of perchloride of mercury and then carried on a special stretcher to the mortuary shed, erected about 55 yards from the hospital.

In the majority of cases, all such bodies were taken from the mortuary to the burning ground, quite up to the pyre, upon a light ambulance car specially kept for the purpose.

Sickness or mortality amongst the Staff.

Pneumonic patients were always kept separated from the plague patients and special precautions were taken by the staff attending such patients. Care was taken to see that ward-boys and native nurses never entered the hospital premises without shoes on. And, as a result of such precautions, the Committee is glad to say that none of the staff working in the Hospital caught the contagion or suffered in any way.

The total number of patients admitted for Plague during the year under report was 36. Of these 26 died and 10 recovered.

	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague ... ..	36	26	10	72.2
Relapsing Fever ... ..	...	...	...	...
Observation and Other Diseases ...	...	...	...	...
Total ...	36	26	10	72.2

Out of the 26 that died, 10 died within 24 hours, 7 within 48 hours, and the remaining 9 after 48 hours from the time of admission into the hospital. Thus the percentage of mortality at different periods after admission into the Hospital is as follows:—

General Percentage of total Mortality.	Percentage of Mortality within 24 Hours.	Percentage of Mortality within 48 Hours.	Percentage of Mortality after 48 Hours.
72.2	27.7	19.4	25

The total admissions during the different months of the year under report were as follow:—

Months.	Plague.	Relapsing Fever	Observation Cases including all General Diseases.	Total.
December ... ..	2	Nil.	Nil.	2
January ... ..	13	Nil.	Nil.	13
February ... ..	9	Nil.	Nil.	9
March ... ..	8	Nil.	Nil.	8
April ... ..	1	Nil.	Nil.	1
May ... ..	3	Nil.	Nil.	3
Total Admissions ...	36			36



The number of admissions was largest in the 3rd week of January. The virulence of cases was greatest during the 2nd and 3rd weeks of January and March. The largest number of deaths was on the 27th January 1899.

Months.	Total Admissions.	Died within 24 Hours.	Died within 48 Hours.	Total Deaths.	Total Recoveries.
December ...	2	...	1	1	1
January ...	13	5	1	9	4
February ...	9	1	3	7	2
March ...	8	2	2	7	1
April ...	1	1	...	1	...
May ...	3	1	...	1	2
During the year ...	36	10	7	26	10

Of the 36 that were admitted into the hospital this year, 22 were males, 10 females and 4 children (under 12). The number of recoveries or deaths among each of these were as follow :—

	Total Admissions.	Deaths.	Recoveries.	Percentage of Deaths.
Males ... ..	22	16	6	72·7
Females ... ..	10	7	3	70·0
Children (under 12 years) ... ..	4	3	1	7·0
Total ... ..	36	26	10	72·2

The total mortality for the year amongst the two sexes and children was as follows :—

Total Mortality for the year.	Mortality amongst men.	Mortality amongst Women.	Mortality amongst Children all under 12 years of age.
26	16	7	3

Out of the 36 admitted this year, only two patients had been previously inoculated.

*Details of cases inoculated previously by Professor Haffkin's prophylactic.*

Name.	Age.	Sex.	Date of inoculation.	Date of attack.	Cured or dead.	Seat of bubo.	Inoculated by.
Shantaram Madhowrao.	10	M	18-1-98.	21-12-98.	Cured. 25-1-99.	Double Inguinal.	Dr. V. S. Trilokekur.
Vinayak Babulji ...	15	M	12-2-98.	25-1-99.	Dead. 1-2-99.	Cervical.	Dr. V. S. Trilokekur.

**Locality.**

The majority of the patients admitted this year was from the C and D wards. More than half the number was from among the people residing on the ground floor.

The types of plague cases treated during the period were as follow :—

With buboes	...	...	...	...	28
Without buboes and without lung complications	...	...	...	...	6
Pneumonic plague without buboes	...	...	...	...	1
Pneumonic plague with buboes...	...	...	...	...	1
Total Admissions	...	...	...	...	36

*The following table shows the Situation of Buboes.*

Situation.	Total No. of cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of Mortality.
Cervical ... ..	2	1	1	2	.....	100 per cent.
Parotid .. ...	.....	.....	.....	.....	.....	.....
R. Axillary ... ..	3	2	1	2	1	66·6 per cent.
L. Axillary ... ..	6	3	3	4	2	66·6 „
R. Femoral ... ..	1	1	.....	1	.....	100 „
L. Femoral ... ..	1	1	.....	1	.....	100 „
R. Inguinal ... ..	6	3	3	5	1	83·3 „
L. Inguinal ... ..	7	4	3	6	1	85·7 „
Other Situations, Testis ...	1	1	.....	.....	1	Nil.
No buboes ... ..	7	4	2	4	2	57·1 per cent.
Multiple buboes ... ..	2	2	.....	1	1	50 „
Left Femoral and Left Sub-maxillary	.....	.....	.....	.....	.....	.....
Both Groins ... ..	.....	.....	.....	.....	.....	.....
Total ...	36	22	13	26	9	

Glands Suppurated in three cases and all of them were freely incised.

*Tables showing Pneumonic Plague with and without Buboes. (Without Buboes.)*

	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males* ... ..	2	1	1	50 per cent.
Females ... ..	.....	.....	.....	.....
Children ... ..	.....	.....	.....	.....

\*In both the cases the diagnosis, arrived at from the physical signs present, was confirmed by bacteriological examinations made by Dr. S. B. Nayak, L.M. & S.

In the second case with buboes pneumonia supervened after 3 days.

**Symptoms.**

In the majority of cases there was a clear history of rat mortality in the houses. Most of them presented the characteristic physiognomy, tongue, pulse, injection of the ocular conjunctiva and thick speech.

In one case which was brought in, in a very low condition, but which ended in recovery, there were corneal ulcers and bed sores.

Vomiting was present in about 60 per cent. of cases. In two cases there was *vomiting of blood shortly before death*. There was diarrhoea in 25 per cent. and constipation in about 47 per cent. of cases. Convulsions were observed in only one instance in the case of a female child aged 5. Urinary trouble manifested itself only in about 13 per cent. of cases. Delirium was present in almost all the cases, yet in more than one case, the patients showed themselves, now and again, quite clear mentally until almost a few moments before death. Headache was complained of in almost all the cases.

**Fever.**

The maximum temperature recorded was 107°. That on admission varied between 101 and 105·8. The pulse rate varied between 120 and 180. Signs of sudden respiratory failure were seen only in two cases. Hiccup was present only in one case.

**Incubation Period.**

Reliable data for drawing inferences regarding the duration of the incubation period of Plague were possible only in 4 cases.

One important fact that leads to the conclusion that the incubation period is *not more than 10 days*, is that whatever few cases occurred in the health camps attached to the hospital occurred always *within 10 days* after admission into the camp.

*Secondly*, that this incubation period is not necessarily ten days, but may be less than 10 in certain cases is proved by the following two cases:—

Patient No. 24 who was an occupant of Camp No. I, Marine Lines, for more than a month, left the camp on 20th February, and went to his house in Tadwady. He got attacked on the 24th of February 1899, *i. e.*, 4 days after his stay in the infected locality. Thus the greatest possible incubation period could be only 4 days in that case.

Patient No. 23 was admitted into Health Camp No. II on the 19th of February 1899. He lived in an infected locality for 4 days before his admission into the health camp. Before that period he spent his days and nights continuously for nearly a fortnight on steamers in the harbour, his work being that of a tally clerk. He got attacked two days after his admission into the camp, thus giving 6 days as the greatest possible limit of the incubation period in that instance. In the third case, the facts lead to conclusion that the incubation period was of more than 7 days. The patient No. 18 was admitted into Health Camp No. II on the 29th January 1899. She got attacked on the 5th of February 1899. Thus the infection that she must have brought with her manifested itself 7 days after her admission into the Camp.

Lastly, in the 4th case, the facts lead one to infer that the incubation period was not more than 14 days.

The patient No. 35, who was an occupant of Health Camp No. II, left it for his house in Second Carpenter Street on the 23rd April 1899. The disease manifested itself for the first time on the 7th of May, *i. e.*, about 14 days after he left the camp.

Thus, from the facts stated above, it appears that the incubation period of Plague varies from 3 to 10 days.



The general line of treatment followed was chiefly stimulant and nutritive. Treatment.—The only antiseptics administered internally were Liq. Iodi, Terechloride Liq. Hyd. Perchlor., and Sodæ Sulpo Carb.

Strophanthus, Strychnia and Caffeine were chiefly used as cardiac tonics. Spartein was also tried in a few cases, Tinct. Ferri. Perchlor., with Liq. Ammon. Acet., was tried with a fair amount of success.

For delirium and insomnia, Morphia with Atropine and Blister over the nape of the neck were usually resorted to.

For Hyperpyrexia no depressing antipyretics were used. Guaiacol Carb. and vapour baths were tried in a few cases without much success. Ice friction or ice-bag over the head and against the Medulla with abdominal ice-pack was found to be attended with a fair amount of success in such cases.

As for local treatment, application of Ext. Belladonna with Tinct. Ferri. Perchloride and Ext. Opii was found somewhat useful as also fomentations.

No special method of treatment such as that by the Curative serums of Roux and Lustig was tried.

SHAMRAO BHAGALE, L.M. & S.,  
Honorary Chief Medical Officer,  
Pathare Prabhu F. H.

BOMBAY, 30th June 1899.

### Report by the Special Medical Officer.

The Committee is to be congratulated on the success of the work they have taken in hand. The line on which the whole plan was carried out is what ought to be done if possible in all these hospitals. The health camp in which people were living after leaving their houses in the city was quite adjacent to the hospital, and the strictest vigilance was kept on the inhabitants of these huts. Cases were promptly removed to the Hospital quite near by. The Hospital itself, as the plan will show, was well planned and was quite complete in itself having wards for plague, observation and also the contacts in one plot. The management of the hospital was also very good. As the Medical Officer remarks, the small amount of patients is, I also think, due to the above measures. The report is a very interesting one.

No. 14.

### Report on the Braham Kshatriya Plague Hospital, Bombay, from the 1st June 1898 to 31st May 1899.

This hospital was first set on foot in the year 1898. The first year it was kept open for only 3 months, viz., during the time when the disease was in its epidemic form. This year it was re-opened at the request of the members of the community under the management of Mr. Vithaldas Parshotum for the benefit of the Braham Kshatriya caste. The balance of the funds was swelled this year by donations from generous members of the caste towards the maintenance of the hospital which was closed after being kept open for four months, viz., February, March, April and May.

A wadi belonging to the same community was turned for the time being into a hospital with the accommodation of 10 patients. Dr. V. S. Divan was in charge of the hospital with one hospital-assistant, one compounder and two ward-boys. The contacts were kept in a wadi specially kept apart for the purpose in the same Pinjrapole Lane close to the hospital.

TABLE I.—*Total Admissions during the year.*

Months.	Plague.	Relapsing fever.	Observation cases including all general diseases.	Total.
3	54	Nil.	3	57

TABLE II.

	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague ... ..	54	35	19	64·8
Relapsing Fever ... ..	Nil.	Nil.	Nil.	...
Observations and other diseases ...	3	Nil.	3	...
Total ...	57	35	22	64·8

TABLE III.

Months.	Total admissions plague.	Died with- in 24 hours.	Within 48 hours	Total deaths.	Total recoveries.	Percentage of Deaths.
3	54	9	9	35	19	64·8 p. c.

If deaths within 24 hours are deducted, the total mortality would stand to 57·7 p. c.

If deaths within 48 hours are also deducted, the total mortality would be 47·2 p. c.

TABLE IV.

Total Admissions.	Deaths.	Recoveries.	Percentage of Deaths.
Males ... .. 31	22	9	70·9 per cent.
Females ... .. 16	10	6	62·5 „
Children (under 12 years) ... .. 7	3	4	42·8 „

TABLE V.—*Table showing the mortality for the year amongst sexes and children.*

Total mortality for the year.	Mortality amongst the men.	Mortality amongst the women.	Mortality amongst children all under 12 years of age.
64·8 per cent.	70·9 per cent.	62·5 per cent.	42·8 per cent.
35	22	10	3

TABLE VI.—*Table showing the situation of Buboes.*

Situation.				Total No. of Cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of Mortality.
Cervical	...	...	...	1	0	1	0	1	50 per cent.
Parotid	...	...	...	0	0	0	0	0	
R. Axillary	...	...	...	8	4	4	7	1	
L. Axillary	...	...	...	1	1	0	1	0	
R. Femoral	...	...	...	20	13	7	10	10	50 „
L. Femoral	...	...	...	5	4	1	3	2	60 „
R. Inguinal	...	...	...	13	8	5	10	3	76.9 „
L. Inguinal	...	...	...	2	2	0	2	0	
* Other situations	...	...	...	1	0	1	0	1	
No Buboes	...	...	...	2	2	0	2	0	
Multiple Buboes	...	...	...	1	1	0	0	1	
Total	...	...	...	54	35	19	35	19	59.2 per cent.

\* Situated on calf of right leg.

TABLE VII.—*Table showing Pneumonic Plague (without Buboes).*

—				Admitted.	Died.	Recovered.	Percentage of Mortality.
Males	...	...	...	Nil.	Nil.	Nil.	Nil.
Females	...	...	...	Nil.	Nil.	Nil.	Nil.
Children	...	...	...	Nil.	Nil.	Nil.	Nil.

TABLE VIII.

*Table showing cases of secondary Plague Pneumonia (complicated with Buboes).*

—				Admitted.	Died.	Recovered.	Percentage of Mortality.
Male	...	...	...	Nil.	Nil.	Nil.	Nil.
Female	...	...	...	Nil.	Nil.	Nil.	Nil.
Children	...	...	...	Nil.	Nil.	Nil.	Nil.

As much has been said in the two previous years' reports on the epidemic, it would be sufficient to mention here that this year's epidemic in no way materially differed from the two previous ones. The type was as virulent, the chief symptoms being high fever, headache, vomiting, and glandular enlargements. In the majority of cases of recovery the buboes suppurate, the treatment was more or less symptomatic, but ice on the head and gland, wet pack and stimulants have been found useful.

V. S. DIVAN,  
Medical Officer,

30th June 1899.



**Report on the G. Lund's Hospital, Bombay,  
from the 26th September 1898 to 30th November 1898.**

The hospital was founded by Mr. G. Lund, in the compound of the late Mr. Justice Telang's properties, for the benefit of the people living in those blocks, as those labouring classes had the great dread of being removed to the hospital, Maratha or Arthur Road.

It was opened on the 26th September 1898, by Mr. Wingate, the Plague Commissioner, Mr. Harvey, the Municipal Commissioner, Mr. DuBoulay, the Deputy Commissioner, and some other gentlemen.

There was no regular Committee formed, but Mr. G. Lund used to come daily to see the management of the hospital; S. Rajaballi V. Patel acted as a Medical Officer in charge, and K. S. Bhimjibhoy R. Ashburner as a secretary, and a Native Hindoo Nurse, one Hindoo Hamal, and two sweepers in all comprised the Hospital staff.

The hospital was composed of three big blocks, two permanent and one temporary, made of zawli; they are quite open on all sides and are about 20 feet high; the half of the largest block was divided into 4 big wards, each accommodating about 10 beds, and the other half was used for the relatives of the patients who were direct attendants.

The other permanent block consists of three big rooms, of which one was used by the nurse, another as a cook-room for the patients, and the third as a store-room.

All the excreta of the patients were received in small tin tarred chatties full of strong solution of carbolic acid one in 20, after having allowed excreta to remain in that strong lotion for some time, the contents were thrown in the latrine baskets in the sweeper gulli which is quite close and easily accessible. The clothes of the patients were soaked in a tub full of strong solution of mercury (1 in 500) for a few hours before they were given to Dhobies.

The water used for drinking purposes was obtained from ordinary water-pipes, while the well water was used for ordinary working purposes.

The wards were thoroughly disinfected with H. P. Solution (1 in 500) and then lime-washed.

The clothes of the patients were taken in our office load car used by coolies to take away disinfectants, to the Narielwadi sterilizer, and were kept there for about 24 hours.

The dead were covered in the hospital sheets soaked in strong carbolic solution, and were taken to the cemeteries to be burnt. The mortuary was situated away from the kitchen and store, and was open. The ground was made of chunam and had no roof and was quite open to the sun.

The poor and the unclaimed dead bodies were taken away and cremated at Mr. G. Lund's expense.

One patient named Rangia Khandoo, age 24, male, Maratha, was inoculated on the 4th September 1898, was attacked with plague on the 4th October 1898, discharged cured from the hospital.

There was neither sickness nor death among the Hospital staff.

TABLE NO. I.—*Total admissions during the year.*

Months.	Plague.	Relapsing fever.	Observation.	Total.
26-9-98 ... ..	Nil.	1	Nil.	1
October ... ..	12	5	9	26
November ... ..	5	Nil.	5	10

The total number of deaths during the whole period is 14.

Deaths from plague 13.

The percentage of deaths is 76·5.

TABLE II.

	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague ... ..	17	13	4	76·5
Relapsing fever ... ..	6	Nil.	6	Nil.
Observation and other diseases.	14	1	13	7·1

*Plague.*

TABLE III.

Months.	Total admissions.	Died within 24 hours.	Died within 48 hours.	Total deaths.	Total recoveries.	Percentage of Deaths.
October ...	12	4	2	9	3	75
November ...	5	2	Nil.	4	1	80

*Relapsing fever.*

26-9-98 ...	1	...	...	...	1	Nil.
October ...	5	...	...	...	5	Nil.
November ...	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.

TABLE IV.

Total admissions.	Deaths.	Recoveries.	Percentage of Deaths.
Males ... .. 32	12	20	37·5
Females ... .. 5	2	3	40·
Children ... .. Nil.	Nil.	Nil.	Nil.

All the patients were of the labouring class of people.

TABLE V.

Total Mortality.	Mortality amongst the Men.	Mortality amongst the Women.	Mortality amongst the Children.
14	12	2	Nil.

TABLE VI.

Situation.	Total number of cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of Mortality.
Cervical ... ..	2	2	<i>Nil.</i>	2	<i>Nil.</i>	100°
R. Axillary ... ..	2	2	"	1	1	50°
L. do. ... ..	1	1	"	1	<i>Nil.</i>	100°
R. Femoral ... ..	4	4	"	2	2	50°
L. do. ... ..	1	1	"	1	<i>Nil.</i>	100°
R. Inguinal ... ..	1	1	"	1	"	100°
L. do. ... ..	1	1	"	<i>Nil.</i>	1	50°

TABLE VII.

Table showing Pneumonic Plague.

They were five only—4 males and one female—all five died within 24 to 48 hours.

These cases when admitted had high fever from 103 to 105°, delirium, pulse 140 to 180. Respiration very shallow.

They had cough from the beginning, the expectoration was blood-tinged and they were quite prostrated.

The Physical examination revealed a patch of consolidation on one of the bases of the lungs, and all the signs of general cyanosis with failing heart.

TABLE VIII.

	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	12	10	2	83·3
Females ... ..	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>
Children ... ..	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>

In these cases secondary Pneumonia supervened from 4th to 8th day of the attack.

*Notes on Symptoms, Character and Treatment of the Disease.*

The number of cases under observation was 14, and they turned out to be remittent fever, continued fever, ordinary fever and cough with chronic bronchitis. One case was found to be gangrene of the lungs, and she died on the fifth day after admission.

G. Lund's Hospital was closed on the 31st of November 1898, in consultation with Mr. Wingate, as there were no indigenous cases in those blocks then, nor any up to the present time. The hospital store, etc., are stored in the same premises, to be at hand whenever the plague breaks out in these Telang's chawls.

RAJABALLY V. PATEL, L. M. & S.,  
Medical Officer, Tarwadi.



## 1. Report on the Hospital.

Report on the Modh and Porwad Plague Hospital,  
Bombay, from the 1st June 1898 to 31st May 1899.

## 2. History of the formation of the Hospital, &amp;c.

When the Plague was raging heavily, and the other hospitals were nearly full of patients, and in some cases when difficulty was experienced in removing the patients to long distances, the leaders of the community thought it better to open an hospital in the midst of their locality and under the supervision of their own caste men. Hence the hospital was opened on the 17th February 1898.

## (a) Names of Committee.

The Hon'ble Mr. Vijbhookhandas Atmaram	...	...	President.
Mr. Bhaidas Narotumdas	...	...	Treasurer.
Mr. Chagonlal Briglal	...	...	Secretary.

## (b) Medical Officer.

Honorary—Dr. Nagindas Maneklal.

## (c) List of Medical Staff.

Hospital Assistant Vinayekrao.
1 Compounder.
1 Qualified Nurse, Mrs. Kirk.
10 Ward Boys.
2 Female Servants.
1 Gate Keeper.
2 Sweepers (one male and one female).
1 Washerman.

## (d) Donation to the Hospital.

Mr. Atmaram Brighbhookhandas	...	...	Rs. 150	per mensem.
„ Damoderdas Tapidas	...	...	„ 100	„
„ Dayabhai Tapidas...	...	...	„ 150	„
„ Choonilal Nagindas	...	...	„ 125	„
„ Devkaran Nanjee	...	...	„ 150	„
Bai Dayakore	...	...	„ 150	„
Mr. Bhaidas Narotumdas	...	...	„ 50	„
„ Harkeesandas Jugjivandas	...	...	„ 50	„
„ Jekeesandas Gangadas gave his own building for the hospital purposes.				

## 3. Description of the Hospital Building Wards, Servants, Quarters, &amp;c.

It is a three-storeyed building, well-ventilated and with sufficient light, situated near the Cawasjee Patel Tank. It belongs to Seth Jekeesandas Gangadas. It contained six different wards—four for Plague cases, one for observation and one for convalescents.

There was a special room for the Dispensary in the same building. One separate storey was allotted for the use of the Nurse and the Hospital Assistant.

Servants were not provided with quarters.

As there were no special contact sheds, contacts were removed to the Churney Road Segregation Camp.

## 4. Conservancy.

The building has permanent privies provided with water tanks. Two sweepers were employed to keep them clean. In all there were six seats. The privies are connected according to the new system with the main sewage, and phenyle water was used from time to time to remove the filth.

Phenyle and carbolic water was used by the sweepers to disinfect clothes before they were handed over to the dhobie.

No suggestion to add.

**5. Water-supply.**

Water was supplied from the main pipes, and no other water was used for any other purpose.

**6. Disinfection of Waters.**

Wards and other rooms were lime-washed and disinfected by the constant use of phenyle lotion, and McDougall's powder was used profusely.

The clothes, *viz.*, the beds and cushions, were disinfected once by the steam disinfectant at Mody Bay. They were sent by a bullock cart and were kept there for about 2 hours.

**7. Disposal of the Dead.**

Immediately after a death occurred the body was wrapped in a sheet well saturated with a solution of Perchloride of Mercury and then carried away to the Mortuary, and thence the body was removed to the Burning Ground, Sonapoor.

Just on the left side of the entrance to the hospital, a room was specially used as a mortuary. The dead bodies of pauper patients were removed to the burning ground, as above, at the expense of the Managing Committee. Special paid carriers were employed for the purpose.

**8. Inoculation by Haffkine's Serum.**

No case already inoculated by Haffkine's serum was admitted in the hospital.

**9. Sickness and Mortality amongst the Hospital Staff.**

One ward-boy got attacked in November last while on night duty. He had high fever and bubo in the right inguinal region, and the source of the contagion appears to be from the plague patients in the hospital. The patient did not live in the hospital, there being no accommodation for the servants. He recovered in 20 days.

TABLE I.—*Total Admissions during the year.*

Months.						Plague.	Relapsing Fever.	Observation cases, including all General Diseases.	Total.
June	1898	..	...	...	...	2	.....	.....	2
July	,,	...	...	...	...	3	.....	.....	3
August	,,	...	...	...	...	...	.....	.....	...
September	,,	...	...	...	..	15	.....	.....	15
October	,,	...	...	...	..	9	.....	.....	9
November	,,	...	...	...	..	2	.....	.....	2
December	,,	...	...	...	...	6	.....	.....	6
January	1899	...	...	...	..	18	.....	.....	18
February	,,	...	...	...	...	47	.....	.....	47
March	,,	...	...	...	...	29	.....	.....	29
April	,,	...	...	...	...	12	.....	.....	12
May	,,	...	...	...	...	2	.....	.....	2
Total						145	.....	.....	145

**11. The largest number of admissions.**

The largest number of admissions was 15, during the second week of February, and 5 on the 15th February.

12. Total number of deaths.  
Total weekly deaths.

The total number of deaths was 109. The total number of deaths from plague was 109. Total weekly deaths as follows :—

Weeks.	Deaths.	Week.	Deaths.	Week.	Deaths.	Week.	Deaths.
1	.....	14	.....	27	1	40	5
2	1	15	4	28	.....	41	6
3	.....	16	.....	29	2	42	10
4	1	17	3	30	1	43	3
5	.....	18	3	31	1	44	4
6	.....	19	2	32	.....	45	4
7	.....	20	1	33	2	46	4
8	1	21	2	34	5	47	.....
9	2	22	.....	35	4	48	1
10	.....	23	.....	36	6	49	.....
11	.....	24	1	37	9	50	.....
12	.....	25	1	38	8	51	.....
13	1	26	.....	39	10	52	.....

The percentage of deaths to admissions 75. The largest number of deaths was 4 on the 19th and 27th February.

TABLE II.

	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague ... ..	145	109	36	75
Relapsing Fever ... ..	.....	.....	.....	.....
Observations and O. D. ... ..	.....	.....	.....	.....
Total ...	145	109	36	75

TABLE III.

Months.	Total Admissions	Died within 24 hours.	Within 48 hours.	Total Deaths.	Total Recoveries	Percentage of Deaths.
June 1898 ... ..	2	2	.....	2	2	100
July " ... ..	3	3	.....	3	.....	100
August " ... ..	.....	.....	.....	.....	.....	.....
September " ... ..	15	3	4	10	.....	66
October " ... ..	9	2	3	6	3	56
November " ... ..	2	1	.....	1	4	50
December " ... ..	6	2	3	6	2	100
January " ... ..	18	5	3	13	.....	72
February 1899 ... ..	47	20	5	35	6	75
March " ... ..	29	10	5	23	9	79
April " ... ..	12	4	2	10	9	83
May " ... ..	2	.....	.....	.....	1	.....
Total ...	145	52	25	109	36	.....

TABLE IV.

Total Admissions.	Deaths.	Recoveries.	Percentage of Deaths.
Males ... .. 104	82	22	79
Females ... .. 26	15	11	42
Children (under 12 years) ... 15	12	3	80

All these admissions were of Hindoos, no other caste was admitted.



TABLE V.—Table showing the mortality for the year amongst Sexes and Children.

Total mortality for the year.	Mortality amongst the Men.	Mortality amongst the Women.	Mortality amongst Children, all under 12 years of age.
109	82	15	12

TABLE VI.—Table showing the Situation of Buboes.

Situation.	Total No. of Cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of Mortality.
Cervical ... ..	7	2	25	3	4	43
Parotid ... ..	.....	.....	.....	.....	.....	.....
R. Axillary ... ..	18	15	3	16	2	89
L. Axillary ... ..	16	11	5	13	3	81
R. Femoral ... ..	4	3	1	4	.....	100
L. Femoral ... ..	5	5	.....	3	2	60
R. Inguinal ... ..	39	27	12	30	9	77
L. Inguinal ... ..	39	29	10	28	11	72
Other situations ... ..	.....	.....	.....	.....	.....	.....
No Buboes ... ..	17	15	2	12	5	70
Multiple Buboes ... ..	.....	.....	.....	.....	.....	.....
Total ... ..	145	107	38	109	36	.....

TABLE VII.—Table showing Pneumonic Plague (without Buboes).

	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	15	11	4	73
Females ... ..	2	1	1	50
Children ... ..	.....	.....	.....	...
Total ... ..	17	12	5	...

Out of 17 cases of Pneumonic Plague only 5 cases recovered. All these cases were isolated.

TABLE VIII.

Table showing cases of Secondary Plague Pneumonia (complicated with Buboes).

				Admitted.	Died.	Recovered.	Percentage of Mortality.
Males	...	...	...	2	1	1	50
Females	...	...	...	...	...	...	...
Children	...	...	...	1	1	...	100

All these cases had distinct Plague symptoms, with Bubo in the Right Axilla.

R. Damoder Ganesh, a compounder was admitted in the hospital on the evening of the 14th February with high fever and Bubo in the R. Axilla. The next morning the Bubo was very hard and painful with some infiltration in the pectoral region. On the 3rd day the Pneumonic symptoms set in and the man died on the fourth day.

A girl aged about 6 was admitted on the 15th February with high fever and Bubo in the R. Axilla. On the 8th day of her admission, another Bubo appeared in the L. Axilla. Both these Buboes were of the diffused type. On the 12th day Pneumonic symptoms set in, and the child died on the 24th day.

The 3rd case recovered. The Pneumonic symptoms set in on the 4th day, and the case was convalescent on the 15th day. Temperature Chart appended. No Bacteriological examination was made. The Pneumonia generally supervened on the 3rd and 4th day.

Notes on the Symptoms, Character and Treatment of the diseases.

Temperature Charts of an acute and a mild case ending in recovery are here-with appended.

Buboes

They are usually accompanied by some pain. Indeed very often the onset of the pain is the first thing to direct the patients to the inflamed gland. Tenderness is an almost invariable sign, and oedema surrounding the bubo. A large amount of surrounding oedema is an unfavourable symptom. They usually come on rapidly, in the majority of cases on the 2nd day, and in some instances on the 4th or 5th day. Their size is from a pea to a small cocoanut. The tabular statement of their situations is already given.

The suppuration generally takes place after 10 days, and the wounds heal very slowly.

Buboes (of diffused type) in both Axillas and above the Poupart's Ligament are most fatal.

A pregnant woman, carrying the 8th month, was admitted one evening with high fever and Bubo in the R. Inguinal. She gave birth to a male child the next morning. The mother died six hours after the delivery and the child on the same evening.

Sequel of the  
disease.  
Period of  
Convalescence.

Insanity, Phthisis, thick speech, and loss of vision.

Generally from 6 to 8 weeks.

The following mixture was found to be very useful :—

R	Sode Bicarbonas	gs. x.	Tint. Digitalis	gs. vi.
	Pot Chloras	gs. x.	Tint. Calumba	3gs.
	Liq. Strychnæ	m.iii	Inf. Cheretta	3i.

The dose was repeated every 3rd or 4th hour as the case may be.

Liq. Hydrargyri Perchloride in large doses was given with no good result. In no case did these large doses induce salivation.

In extreme weak pulse, Hypodermic injection of Strychnine, Digitalis and ether was given.

For Delirium.—Sulphonal combined with Ammo. Bromide, Ammo. Bromide and Tinct. Hyoscyam, Bromidia, and Liq. atropiæ in small doses.

Vomiting—Ice to suck—Sodi Bicarbonas, Bismuthi, Acid Hydrocyan Dil., &c., internally : and Ice Bags, Tinct. Iodine, Sinapisms over the Epigastrium.

Tympanites—Turpentine Stupes and Hot Linseed Meal Poultices over the Abdomen—and if constipation, Enemata of warm water and Turpentine.

Pulmonary Congestion, Diffusible Stimulants, Turpentine Stupes and Linseed Meal Poultices, and Alcoholic Stimulants.

Tinct. Musk, Carbolic acid and Tinct. Iodine were given internally with some success.

Buboes—Continuous application of Ice. Empi. Hydrargyri. Glycerine and Ext. Belladonna and Linseed Poultices.

The wounds were dressed with Carbolic oil and Iodoform.

The dressings and bandages used for Bubo cases were all burnt.

Not a single case of Plague was treated by the Curative Serum of Lustig during the year, as it was not supplied to the hospital.

NAGINDAS MANEKLAL, M. O.,

*In-charge Medical Modh and Porwad Plague Hospital.*

BOMBAY, Bhuleshwar, 1st July 1899.

*Notes by the Special Medical Officer.*

This hospital was situated in the densely crowded part of Bhuleshwar. Otherwise the building was very well suited for a hospital, being large, airy and well lighted. The hospital arrangements were always most satisfactory and the patients well looked after.

30th June 1899.

No. 17.

### **Report on the Kapole and Lad Joint Plague Hospital Bombay, from the 1st June 1898 to 31st May 1899.**

This hospital was first started in the beginning of the year 1898 by the conjoint efforts of Kapole and Lad Banias. It is a sectarian institution, being maintained from a general caste contribution towards a fund raised for the purpose.

Dr. R. Rao, M.D. (London), acts as honorary physician, and Dr. V. S. Divan is in charge of the hospital, with the following staff :—

- 1 Hospital Assistant,
- 1 Compounder,
- 1 Nurse, and
- 8 Ward-boys.

A place known as Ladni Wadi (a big building with spacious verandahs attached), is utilized for the purpose, and it furnishes accommodation of 50 patients, the contacts being segregated in Lahver Baug, Kalbadevi Road.



The total number of Kapole and Lad community in normal times amounts to about 2,000 and 1,000 respectively; but during the epidemic, most of these people had either left for their native country or lived in the suburbs, and it would be therefore not fair to draw any definite conclusion from the total number of these people.

TABLE I.—*Total admissions during the year.*

Months.	Plague.	Relapsing Fever.	Observation cases including General Diseases.	Total.
12	92	<i>Nil.</i>	12	104

TABLE II.

	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague ... ..	92	78	14	84·6
Relapsing fever ... ..	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	.....
Observations and other diseases.	12	7*	5	58·3
Total ...	104	85	19	.....

\* (2) died from fever and chronic bronchitis; (1) from fever and asthma; (1) from acute peritonitis and (3) from suspicious fever, but no plague germs could be detected. Some of these patients came voluntarily because nobody could take care of them at home.

TABLE III.

Months.	Total Admissions Plague.	Died within 24 hours.	Within 48 hours.	Total Deaths.	Total recoveries.	Percentage of Mortality.
12	92	15	19	78	14	84·7 per cent.

If deaths within 24 hours are deducted, the total mortality would stand to ... 81·8 per cent.

If deaths within 48 hours are also deducted, the total mortality would stand to. 75·8 „

TABLE IV.

Total Admissions.					Deaths.	Recoveries.	Percentage of Deaths.
Males ... ..	59	51	8	86·4			
Females ... ..	33	27	6	81·8			
Children (under 12 years) ...	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	.....			

TABLE V.—Table showing the mortality for the year amongst sexes and children.

Total mortality for the year.	Mortality amongst the men.	Mortality amongst women.	Mortality amongst children all under 12 years of age.
84.7 per cent.	86.4 per cent.	81.8 per cent.	<i>Nil</i>
78	51	27	.....

TABLE VI.—Table showing the situation of Buboes.

Situations.	Total No. of cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of Mortality.
Cervical ... ..	3	2	1	2	1	66.6 p. c.
Parotid ... ..	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>
R. Axillary ... ..	12	6	6	11	1	91.6 p. c.
L. „ ... ..	11	6	5	10	1	90.9 p. c.
R. Femoral ... ..	15	9	6	12	3	80 p. c.
L. „ ... ..	9	7	2	8	1	88.8 p. c.
R. Inguinal ... ..	18	14	4	14	4	77.7 p. c.
L. „ ... ..	19	11	8	17	2	89.4 p. c.
Other situations . . .	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>
No Buboes ... ..	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>
Multiple Buboes ... ..	1	1	<i>Nil.</i>	<i>Nil.</i>	1	.....
Total ... ..	88	56	32	74	14	84 p. c.

TABLE VII.—Table showing Pneumonic Plague (without Buboes.)

	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	3	3	<i>Nil.</i>	.....
Females ... ..	1	1	<i>Nil.</i>	.....
Children ... ..	.....	.....	.....	.....
Total ... ..	4	4	.....	.....

TABLE VIII.

Table showing cases of Secondary Plague Pneumonia. (complicated with Buboes).

	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	1	1	<i>Nil.</i>	.....
Females ... ..	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	.....
Children ... ..	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	.....
Total ... ..	1	1	<i>Nil.</i>	.....

As much has been said in the two previous years' reports on the epidemic, it would be sufficient to mention here that this year's epidemic in no way materially differed from the two previous ones. The type was as virulent, the chief symptoms being high fever, headache, vomiting and glandular enlargements. In the majority of cases on recovery the buboes suppurate, the treatment was more or less symptomatic, but ice on the head and gland, wet-pack and stimulants have been found useful. One patient was treated by Lustig's serum but proved fatal.

V. S. DIVAN,  
*Medical Officer.*

No. 18.

### Report on the Thacoredwar Lohana Plague Hospital, Bombay, from the 1st June 1898 to 31st May 1899.

This hospital was first opened last year in the month of March, in a Wadi belonging to the same community. This Wadi was turned into a hospital and it afforded accommodation of 35 patients.

Dr. V. S. Divan was in charge of the hospital, with one Hospital Assistant and four ward-boys. The standing expenditure of the hospital is defrayed from a fund raised amongst the Lohana themselves. The contacts are kept in a large building attached to the hospital.

TABLE I.—*Total admissions during the year.*

Months.	Plague.	Relapsing Fever.	Observation cases including all general diseases.	Total.
12	151	<i>Nil.</i>	10	161

TABLE II.

Admissions.			Deaths.	Recoveries.	Percentage of Mortality.
Plague	...	151	113	38	74·8 p.c.
Relapsing Fever	...	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>
Observations and other Diseases.		10	2	8	20 p.c.
Total	...	161	115	46	...

TABLE III.

Months.	Total Admissions Plague.	Died within 24 hours.	Within 48 hours.	Total Deaths.	Total recoveries.	Percentage of Deaths.
12	151	34	23	113	38	74·8

If deaths within 24 hours are deducted, the total mortality would stand to 67·5 p. c.

If deaths within 48 hours are also deducted, the total mortality would stand to 59·5 p. c.



TABLE IV.

Total Admissions.					Deaths.	Recoveries.	Percentage of Deaths.
Males	107	...	...	...	85	22	79·4 p. c.
Females	34	...	...	...	22	12	64·7 p. c.
Children (under 12 years)	10	...	...	...	6	4	60 p. c.

TABLE V.—Table showing the Mortality for the year amongst sexes and children.

Total Mortality for the year.	Mortality amongst the men.	Mortality amongst women.	Mortality amongst children all under 12 years of age.
74·8 p. c.	79·4 p. c.	64·7 p. c.	60 p. c.
113	85	22	6

TABLE VI. — Table showing the Situation of Buboes.

Situation.	Total No. of cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of Mortality.
Cervical ... ..	4	2	2	2	2	50 per cent.
Parotid ... ..	2	2	<i>Nil.</i>	2	<i>Nil.</i>	.....
R. Axillary ... ..	12	10	2	8	4	66·6 per cent.
L. Axillary ... ..	27	15	12	23	4	85·1 „
R. Femoral ... ..	30	26	4	24	6	80 „
L. Femoral ... ..	45	35	10	33	12	73·3 „
R. Inguinal ... ..	8	6	2	5	3	62·5 „
L. Inguinal ... ..	10	7	3	6	4	60 „
Other situations ... ..	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	.....
No Buboes ... ..	3	3	<i>Nil.</i>	3	„	.....
Multiple Buboes ... ..	3	2	1	1	2	33·3 per cent.
Total ... ..	144	108	36	107	37	74·3 per cent.

TABLE VII.—Table showing Pneumonic Plague (without Buboes).

					Admitted.	Died.	Recovered.	Percentage of Mortality.
Males	...	...	...	...	6	5	1	83·3 per cent.
Females	...	...	...	...	1	1	<i>Nil.</i>	.....
Children	...	...	...	...	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	.....
Total	...	...	...	...	7	6	1	85·7 per cent.

TABLE VIII.

*Table showing cases of Secondary Plague Pneumonia (complicated with Buboes).*

	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	} Nil.	Nil.	Nil.	Nil.
Females ... ..				
Children ... ..				

As much has been said in the two previous years' reports on the epidemic, it would be sufficient to mention here that this year's epidemic in no way materially differed from the two previous ones. The type was as virulent; the chief symptoms being high fever, headache, vomiting and glandular enlargements. In the majority of cases of recovery the buboes suppurate, the treatment was more or less symptomatic but ice on the head and gland, wet pack and stimulants have been found useful.

V. S. DIVAN,

*Medical Officer.*

30th June 1899.

*Notes by the Special Plague Medical Officer.*

Situating in a densely crowded part of the City—viz., in Buleshwar.

No. 19.

**Report of the Telugu Hospital for the year 1898-1899.**

I. Report on the Telugu Plague Hospital, Bombay, from the 1st of June 1898 to the 31st of May 1899.

II. The hospital was founded in the month of April 1897 and opened on the 14th of the same month. A public subscription was circulated among the various Telugu Communities, and the fund amounted to nearly 1,500 rupees. In that year a Committee consisting of late Mr. Karady Lingu, Messrs. Manajee Rajoojee, Abbajee Abboo, and Mulloo Luxman as Secretary, was formed, and the hospital management was carried for a period of 4 months by the above Committee. When the hospital fund was exhausted, a gentleman by name Mr. Rajoo Babaji (who is at present supporting the hospital) came forward and offered 200 rupees; and then for the following 8 months, *i. e.*, from September 1897 to May 1898, the expenses were borne by Rao Bahadur Ellapa Ballaram.

The hospital was again supported by subscription till 31st of December 1898.

From January 1899 up to date Mr. Rajoo Babajee, a well-known Mill Contractor of Shett Lukhmidass Khinji, has borne all the expenses.

The Hospital Committee lasted up to December 1898; after this Mr. Rajoo Babajee, the present donor, took over sole charge and management of the hospital from the Committee, and has given full liberty to all persons seeking aid of this hospital to have treatment of any doctor, Vaid, or Hakeem, thus encouraging people to resort to the hospital.

*Hospital Staff.*

Medical Officer	...	P. J. Svami (Honorary.)
Ward-boys	...	3
Ayah	...	1
Dhobe	...	1
Sweepers	...	2 Supplied by the Municipality.
Ramosees	...	2 Do. do.

III. The hospital is situated in a thickly populated locality ; it consists of a one story building, built of stone. Formerly it was used to celebrate marriage ceremonies. It is 46 feet by 35 feet. It has 6 wards, 3 on the ground and 3 on the upper floor. On the ground floor each ward measures  $23\frac{1}{2}$  feet in length, 10 feet in breadth, and 13 feet in height, and has a verandah measuring 46 feet by  $8\frac{1}{2}$  feet. The upper floor has also a gallery and each ward measures  $23\frac{1}{2}$  feet long, 10 feet broad, and  $10\frac{1}{2}$  feet high. Two beds are generally placed in a ward.

Adjoining to the hospital on the north side of it, there is also a building which contains (6) six rooms, 3 on the ground floor, and 3 on the upper floor. This building is 28 feet long,  $12\frac{3}{4}$  feet broad and  $19\frac{3}{4}$  feet high. Each room is  $10\frac{3}{4}$  feet  $\times$   $8\frac{1}{2}$  feet  $\times$  9 feet.

As for the dispensary some arrangements were made on the gallery of the upper story.

There is a contact shed to the east of the hospital, erected on the Municipal grounds, but very little use was made of it. There is a Government Girls' School close by in which accommodation is found for the servants.

IV. In the hospital compound there are latrines, (2) two worked by the flushing system and one is cleaned by sweepers. Each has one seat. The sewage and waste water are carried away by the underground drain.

The clothes of patients are saturated in solution of Perchloride of Mercury for 24 hours previous to their being given to Dhobies.

V. The water supply is derived from the pipe which supplies the City of Bombay.

VI. The hospital wards are disinfected twice a day with a solution of Perchloride of Mercury—strength 1 in 1,000 ; after that Carbolic powder is sprinkled over. The privies and drains and the hospital surroundings, drains, &c., are disinfected with a solution of phenyle. No Steam Disinfector was used in the hospital.

VII. As soon as a patient died, the body as it laid on the cot, was removed to the Mortuary. The Mortuary is situated on the north side of the hospital, about 50 feet from it ; it is built of bamboo tatties and measures 20  $\times$  20 feet.

The funeral of Pauper patients was performed by charitable persons who paid the necessary expenses for their disposal.

IX. The staff of the hospital did not suffer from any illness.

X. TABLE I.—*Total admissions during the year.*

Months.					Plague.	Relapsing fever.	Observation cases including all general diseases.	Total.
June	1898	...	...	...	.....	.....	.....	.....
July	"	...	...	...	.....	.....	.....	.....
August	"	...	...	...	18	.....	.....	18
September	"	...	...	...	28	1	.....	29
October	"	...	...	...	16	.....	1	17
November	"	...	...	...	<i>Nil.</i>	.....	.....	.....
December	"	...	...	...	6	.....	.....	6
January	1899	...	...	...	15	1	3	19
February	"	...	...	...	58	.....	3	61
March	"	...	...	...	62	.....	.....	62
April	"	...	...	...	34	.....	2	36
May	"	...	...	...	8	.....	.....	8



XI. Largest number of admissions during the week (24th—31st of March 1899) was ... .. 18

Largest number of admissions was on the following days :—

17th August 1898 ... .. 6

27th March 1899 ... .. 6

XII. Total number of deaths during the year 1898-1899 ... 198

Total number of deaths from plague ... .. 190

Percentage of deaths to admissions ... .. 77·34

Total number of deaths during the year.	Total number of deaths from Plague.	Percentage of deaths to admissions.
198	190	77·34

Largest number of deaths, viz., 5 took place on the following days :—7th February 1899 and 15th March 1899.

*Table showing total weekly deaths and percentage of deaths to admissions.*

Week ending	Admissions.	Deaths.	Percentage of Deaths to Admissions.	Week ending	Admissions.	Deaths.	Percentage of Deaths to Admissions.
6th Aug. 1898...	2	1	50·	21st Jan. 1899...	4	3	75·
13th " " ...	.....	1	.....	28th " " ...	11	6	55·4
20th " " ...	8	6	75·	4th Feb. " ...	7	3	42·8
27th " " ...	7	4	55·7	11th " " ...	13	13	100·
3rd Sept. " ...	2	2	100·	18th " " ...	16	8	50·
10th " " ...	5	6	120·	25th " " ...	17	13	76·2
17th " " ...	6	3	50·	4th Mar. " ...	16	13	81·25
24th " " ...	5	5	100·	11th " " ...	12	8	66·6
1st Oct. " ...	11	7	63·6	18th " " ...	11	13	118·18
8th " " ...	10	4	40·	25th " " ...	16	10	62·5
15th " " ...	7	8	114·2	1st Apr. " ...	18	16	88·8
22nd " " ...	.....	1	... ..	8th " " ...	10	5	50·
29th " " ...	.....	.....	... ..	15th " " ...	6	6	100·
10th Dec. " ...	2	2	100·	22nd " " ...	13	10	76·9
17th " " ...	.....	.....	.....	29th " " ...	7	3	42·8
24th " " ...	2	.....	.....	6th May " ...	3	6	200·
31st " " ...	2	1	50·	13th " " ...	3	2	66·6
7th Jan. 1899...	.....	1	.....	20th " " ...	1	1	100·
14th " " ...	1	.....	.....	27th " " ...	1	...	0·

TABLE II.

	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague ... ..	245	190	55	77·5
Relapsing Fever ... ..	2	1	1	50·
Observation and other diseases ... ..	9	7	2	77·7
Total ... ..	256	198	58	.....

TABLE III.

Months.	Total Admissions.	Died within 24 hours.	Died within 48 hours.	Total Deaths.	Total Recoveries.	Percentage of Deaths.
June 1898 ...	.....	.....	.....	.....	.....	.....
July " ...	.....	.....	.....	.....	.....	.....
August " ...	18	4	8	15	3	83·3
September " ...	29	9	5	23	6	79·3
October " ...	17	2	4	13	4	76·4
November " ...	.....	.....	.....	.....	.....	.....
December " ...	6	2	1	4	2	66·6
January 1899 ...	19	2	6	13	6	68·4
February " ...	61	16	3	46	15	75·4
March " ...	62	17	13	50	12	80·6
April " ...	36	9	11	28	8	77·7
May " ...	8	5	.....	6	2	75·0

TABLE IV.

Total Admissions.				Deaths.	Recoveries.	Percentage of Deaths.
Males ...	...	...	118	98	20	83·05
Females ...	...	...	88	63	25	71·59
Children ...	...	...	50	37	13	74·0

TABLE V.—Table showing the Mortality for the year amongst Sexes and Children.

Total Mortality for the year.	Mortality amongst Men.	Mortality amongst Women.	Mortality amongst Children under 12 years.
198	98	63	37

TABLE VI.—Table showing the Situation of Buboes.

Situation.	Total No. of cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of Mortality.
Cervical ...	28	15	13	25	3	89·28
Parotid ...	6	5	1	6	.....	100·
Right Axillary ...	42	24	18	34	8	42·8
Left do. ...	55	27	28	44	11	80·
Right Femoral ...	35	18	17	23	12	65·7
Left do. ...	24	13	11	18	6	75·
Right Inguinal ...	30	16	14	22	8	73·3
Left do. ...	23	12	11	18	5	78·26
Other Situation ...	Nil.	Nil.	Nil.	Nil.	Nil.	.....
No Buboes ...	Nil.	Nil.	Nil.	Nil.	Nil.	.....
Multiple Buboes ...	2	1	1	.....	2	0·

## TABLE VII.

*Nil.*

## TABLE VIII.

*Nil.*

No routine line of treatment was adopted and every case was treated according to symptoms present.

Patients in a collapse condition were treated with stimulants, *viz.*, Æther, Digitalis, Strychnine, Brandy, and Ammonia, some hypodermically, and sometimes by the mouth. Nutritive enemata were given.

Buboes were generally Femoral and Axillary, and appeared on the 2nd, 3rd and 4th day of the outset. Very few glands subsided, most suppurated between 8 and 12 days.

Left Groin and Left Axilla most fatal.

Convalescence lasts from 4 to 6 weeks.

In conclusion, I cannot help but thank Lieut. French, District Officer, for his kindness towards the staff, and patients of this hospital; and also for the great interest he took in the hospital matters.

It must not be omitted to mention here that Dr. M. N. Kapadia, by his kind treatment to the afflicted persons in the section, contributed a great deal towards the progress of the hospital.

With these few observations I beg to conclude the report.

P. J. SVAMI,

*Honorary Physician,*

*Telugu Plague Hospital.*

*Notes by the Special Medical Officer.*

This hospital is situated in a densely crowded part of Camateepura and though it did good, I cannot help stating that I think that the rooms used as wards were very small and ill-ventilated.

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No. 20.

**Report on the Third Bhoivada Plague Hospital,  
Bombay, from the 1st June 1898 to 31st May 1899.**

This hospital was first opened on the 1st of May 1897, by Sorathia and Nagar Baniyas for the benefit of their own community through the exertion of Mr. Kababhai Virchand. Dr. V. S. Divan is in charge of the hospital, with 1 Hospital Assistant, a nurse and 2 ward-boys. The maintenance of the hospital is carried on from a general fund raised by the Sorathia and Nagar Baniyas among themselves.

The Wadi, an open building, set apart for caste meetings and feasts, is temporarily converted into a hospital with an accommodation of 15 patients; the contacts being accommodated in a similar Wadi just opposite.



TABLE I.—*Total admissions during the year.*

Months.	Plague.	Relapsing Fever.	Observation cases including all General Diseases.	Total.
12	142	<i>Nil.</i>	2	144

TABLE II.

	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague ... ..	142	116	26	81·8 p. c.
Relapsing Fever ... ..	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	.....
Observations and other Diseases ...	2	<i>Nil.</i>	2	.....
Total ...	144	116	28	83·4 p. c.

TABLE III.

Months.	Total Admissions, Plague.	Died within 24 hours.	Within 48 hours.	Total Deaths.	Total Recoveries.	Percentage of Deaths.
12	142	32	29	116	26	81·6 p. c.

If deaths within 24 hours are deducted, the total mortality would stand to 76·3 p. c.

If deaths within 48 hours are also deducted, the total mortality would be 67·9 p. c.

TABLE IV.

Total Admissions.	Deaths.	Recoveries.	Percentage of Deaths.
Males ... .. 103	87	16	84·4 per cent.
Females ... .. 30	23	7	76·6 do.
Children (under 12 years) ... 9	6	3	66·6 do.

TABLE V.—*Table showing the Mortality for the year amongst Sexes and Children.*

Total mortality for the year.	Mortality amongst the men.	Mortality amongst women.	Mortality amongst children all under 12 years of age.
81·6 per cent.	84·4 per cent	76·6 per cent	66·6 per cent.
116	87	23	6

TABLE VI.—Table showing the situation of Buboos.

Situation.	Total number of cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of Mortality.
Cervical ... ..	1	<i>Nil</i>	1	1	<i>Nil</i> .	...
Parotid ... ..	1	1	<i>Nil</i> .	1	<i>Nil</i> .	...
R. Axillary ... ..	12	10	2	8	4	66·6 per cent.
L. Axillary ... ..	25	16	9	23	2	92 do.
R. Femoral ... ..	25	20	5	21	4	84 do.
L. Femoral ... ..	62	46	16	50	12	80·6 do.
R. Inguinal ... ..	2	2	<i>Nil</i> .	4	1	50 do.
L. Inguinal ... ..	5	4	1	1	1	80 do.
Other Situations ...	<i>Nil</i> .	<i>Nil</i> .	<i>Nil</i> .	<i>Nil</i> .	<i>Nil</i> .	...
No Buboos ... ..	1	1	<i>Nil</i> .	1	<i>Nil</i> .	...
Multiple Buboos ...	2	2	<i>Nil</i> .	1	1	50 per cent.
Total ... ..	136	102	34	111	25	81·6 per cent.

TABLE VII.—Table showing Pneumonic Plague (without Buboos.)

	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	6	5	1	83·3 p.c.
Females ... ..	<i>Nil</i> .	<i>Nil</i> .	<i>Nil</i> .	...
Children ... ..	<i>Nil</i> .	<i>Nil</i> .	<i>Nil</i> .	...
Total ... ..	6	5	1	83·3 p.c.

TABLE VIII.—Table showing cases of secondary Plague Pneumonia (complicated with Buboos).

	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	<i>Nil</i> .	<i>Nil</i> .	<i>Nil</i> .	<i>Nil</i> .
Females ... ..	<i>Nil</i> .	<i>Nil</i> .	<i>Nil</i> .	<i>Nil</i> .
Children ... ..	<i>Nil</i> .	<i>Nil</i> .	<i>Nil</i> .	<i>Nil</i> .

As much has been said in the two previous years' reports on the epidemic, it would be sufficient to mention here that this year's epidemic in no way materially differed from the two previous ones. The type was as virulent, the chief symptoms being high fever, headache, vomiting, and glandular enlargements. In the majority of cases of recovery the buboes suppurate; the treatment was more or less symptomatic, but ice on the head and gland, wet pack, and stimulants have been found useful.

30th June 1899.

V. S. DIVAN,  
Medical Officer.

*Notes by the Special Medical Officer.*

The hospital was situated in a densely crowded part of the city. I am not at all satisfied with the sanitary condition of the situation. Ventilation and light, bad. I think this place quite unsuitable for a Private Hospital.

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No. 21.

### **Jain Hospital, Parel.**

BOMBAY, 28th June 1899.

I. Report on the Parel Plague Jain Hospital, Bombay, from the 1st of June 1898 to 31st of May 1899.

II. The hospital was opened in April 1897. It was originally a small shed and when the monsoons set in, the authorities concerned converted the shed into a *pucca* hospital. The donors of the hospital are members of the Vissa Jain, and the Committee consists of the following gentlemen :—Mr. Dhamjee Lukmichand, J. P., Mr. Luckumsy Napoo Nansy, J. P., and Mr. Barwal Rawjee, who is the most prominent man and takes very active part in the hospital affairs. The Medical Officer in charge of the hospital is Dr. N. F. Pereira. The Medical Staff consists of a Medical Officer abovementioned, two Hospital Assistants and six Ward-boys, one Dhobie and a cook. The donations which the hospital received are the voluntary contributions from the members of the Jain community.

III. The hospital buildings are divided into 8 wards, 4 of which are for the male patients, 2 for the female, one is used for segregation or contacts, and one for convalescents. The whole building measures 150 feet in length and 30 feet in breadth. The Dispensary is attached to the convalescent ward. English as well as country medicines are kept. The servants' quarters are adjacent to the same ward. The contact sheds which are apart from the other sheds can accommodate 12 patients; at present no one is confined here. The hospital buildings are very well ventilated and every measure that is needed towards the cleanliness of the place is strictly carried out.

IV. There are four latrines. The excretions are first disinfected in the wards, whence they are deposited in the latrines and removed as usual by the Halal-core. The latrines have a seat each and are about 80 or 90 yards apart from the hospital buildings. The clothes are disinfected with Perchloride of Mercury Solution and Chloride of Lime, and then the same are handed over to the dhobie. No suggestions can be made as the present procedure is all that can be desired.

V. The supply of water is derived from the Vehar Lake.

VI. In disinfecting the hospital buildings, (1) Phenyle and Carbolic Lotion and (2) Chloride of Lime and Perchloride of Mercury are used. The place is systematically disinfected twice a day, morning and evening.

VII. The dead, whether poor or rich, are all conveyed to Tank Bunder and there cremated. The 1st ward facing the east is used as a Mortuary. No sooner is a patient dead, than he is at once removed here and placed on the floor in accordance with the customs of the Vissa community. After the remains are removed the place is thoroughly disinfected.

VIII. *Nil.*

IX. *Nil.*



TABLE I.

Months.				Plague.	Relapsing Fever.	Observation cases including all General diseases.	Total.
June	1898	...	...	1	1	<i>Nil.</i>	2
July	"	...	...	5	<i>Nil.</i>	"	5
August	"	...	...	16	"	3	19
September	"	...	...	19	"	<i>Nil.</i>	19
October	"	...	...	15	1	2	18
November	"	...	...	6	<i>Nil.</i>	3	9
December	"	...	...	17	"	<i>Nil.</i>	17
January	1899	...	...	34	1	"	35
February	"	...	...	35	<i>Nil.</i>	"	35
March	"	...	...	57	3	"	60
April	"	...	...	23	<i>Nil.</i>	"	23
May	"	...	...	15	"	"	15
Total				243	6	8	257

TABLE II.

	Admissions.	Deaths.	Recoveries.	P. C. of Mortality.
Plague ... ..	243	194	49	80 p. c.
Relapsing fever observation ... ..	6	2	4	32 p. c.
Other disease ... ..	8	6	2	25 p. c.
Total... ..	257	202	55	75 p. c.

TABLE III.

Months	Total admissions.	Died within 24 hours.	Died within 48 hours.	Total deaths	Total recoveries.	Percentage of Mortality.
1898						
June ... ..	2	1	1	2	None.	100 p. c.
July ... ..	5	4	None.	4	1	80 "
August ... ..	19	3	None.	16	3	80 "
September ... ..	19	5	3	13	6	65 "
October ... ..	18	8	2	13	5	65 "
November ... ..	9	1	None.	4	5	50 "
December ... ..	17	7	None.	14	3	85 "
1899						
January ... ..	35	5	6	30	5	85 "
February ... ..	35	14	4	28	7	75 "
March ... ..	60	20	5	45	15	75 "
April... ..	23	8	3	19	4	80 "
May... ..	15	6	2	14	1	93 "

TABLE IV.

Total admissions.	Deaths.	Recoveries.	P. C. of Mortality.
Male ... ..	165	40	75 per cent.
Female ... ..	21	10	50 per cent.
Children under 12 years...	16	5	70 per cent.

TABLE V.—Table showing the Mortality for the year amongst sexes and children.

Total mortality for the year.	Mortality amongst men.	Mortality amongst women.	Mortality amongst children, all under 12 years of age.
202	165	21	16

TABLE VI.—Table showing the situation of Buboes.

Situation.	Total No. of Cases.	Males.	Females.	Mortality.	Recovery.	Percentage of Mortality.
Cervical ... ..	13	11	2	8	5	60 per cent.
Parotid ... ..	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	
R. Axillary ... ..	35	32	3	32	3	90 per cent.
L. „ ... ..	25	20	5	17	8	70 per cent.
R. Femoral ... ..	88	76	12	67	21	75 per cent.
L. „ ... ..	55	47	8	47	8	85 per cent.
R. Inguinal ... ..	1	1	None	1	<i>Nil.</i>	100 per cent.
L. „ ... ..	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	<i>Nil.</i>	
Other Situations ...	4	3	1	2	2	50 per cent.
No Buboes ... ..	22	22	<i>Nil.</i>	20	2	90 per cent.
Multiple Buboes ...	.....	.....	.....	.....	.....	

TABLE VII.—Table showing Pneumonic Plague without Buboes.

	Admitted.	Died.	Recovery.	Percentage of Mortality.
Males ... ..	22	20	2	90 per cent.
Females ... ..	None.	None.	None.	.....
Children ... ..	None.	None.	None.	.....

TABLE VIII.

					Admissions.	Died.	Recoveries.	Percentage of Mortality.
Males	...	...	...	...	10	7	3	70 per cent.
Females	...	...	...	...	2	1	1	50 per cent.
Children	...	...	...	...	....	.....	.....	.....

*Notes by the Special Medical Officer.*

The hospital buildings were fairly well situated in an open space. The Hospital was well managed.

## No. 22.

**The Annual Report of the Jain Plague Hospital, Lall Baug in C. Ward from the 1st of June 1898 to the 31st of May 1899 according to the lines indicated in your instructions-sheet.**

2. The hospital has been opened since the 20th December 1896. It was at first located on the Arthur Road in sheds raised for the purpose and since the 23rd May 1897 it is removed to the present locality, Lall Baug. There was no private Plague Hospital when it was started. The detailed account is given in the first Annual Report forwarded in June 1897.

The hospital is founded by Mr. Manekchand Kapurchand, who has received the distinction of Rao Bahadur under the current New-Year-Day-Honours. It is maintained by the Jain Community. It receives no regular contribution from the people. Rao Bahadur Manekchand Kapurchand is the Manager, and Mr. Amarchand P. Parmar is the Secretary. This hospital has ever been going on since its opening.

*Names of the Committee Members.*

1. Mr. Virchand Dipchand, C. I. E.,
2. „ Premchand Raichand, J. P.,
3. Rao Bahadur Manekchand Kapurchand,
4. Mr. Abhechand Kasturchand,
5. „ Bechardas Manchand,
6. „ Krishnaji Rangji.
7. „ Raichand Khushal,
8. „ Amarchand P. Parmar.

*Medical Officer.*

Maganlal Umiashankar Bhatt, L.M. & S.

*House Surgeon.*

Trikamlal Amthashah, 3rd year Medical Student, Grant Medical College.

*Hospital Assistants.*

1. Sadashiv Vishnu.
2. Surma.

*Compounder.*

Kashinath Wasudev.

*Nurse.*

Gangabai Sudin. (Unqualified native nurse. She is in the hospital service for these 2 years.



There were 16 Ward-boys, 4 Ayahs, 2 servants—one for Dispensary and Store-room and the other for the Cook-room, 1 Store-keeper, 1 Gate-keeper, 1 Brahmin cook, 1 barber, and 2 halalkhors in the first quarter of the current year when the number of patients was largest. The Manager reduces the number of the Hospital Staff when patients are less in the hospital. At present there are only 2 ward-boys, 1 servant, 1 nurse, 1 cook, 1 store-keeper and 2 halalkhors with 1 Hospital Assistant and 1 Compounder.

As to Donations to the hospital, nothing is received through me.

3. This hospital is located in Lall Baug lying between Madhav Baug and Pinjrapole.

The Lall Baug is originally designed and erected for the use of celebrating marriages and other festive occasions of the Jains and other caste-Hindus and giving their dinner parties. It is therefore in the form of one big open oblong—with roofed verandahs on all sides, but the west where there exists one open verandah. Adjacent to this verandah is one two-storied building. Its ground floor has got cooking rooms, servants' quarters and store-rooms. There is also another one-storied building on the gate and its adjacent south verandah which contain two upper wards and quarters of the contacts and the servants, and unoccupied rooms at the disposal of the House-Surgeon and the Hospital Assistant. The gate communicates on the outside with one long passage which has verandahs on either side—one is roofed and the other is open.

The place is sufficiently large and accommodating for the hospital requirement, as well as for the quarters for the contacts and the Hospital Staff. There exists in this hospital accommodation for 20 contacts. There is a segregation house situated at Phydhoni, C Ward.

From a hygienic point of view, the place, though situated in the very heart of the City, is tolerably good for a hospital purpose. Light and air are freely admitted into every part of the building. It has got very large breathing spaces both in its own compound and vicinity on all sides. It is open and not surrounded by any building higher than its own. Nowhere it has got any house or street drain excepting on the north, where its own drain passes out from the middle of the oblong. It is closed on this side.

There are in all 12 wards divided into two parts, *viz.*, Lower and Upper. The former has three wings consisting of 10 wards; they are set apart for plague cases and have got 40 beds. Out of the three wings one is allotted to female and has 3 wards, *viz.*, 1 Convalescent and Improving, 1 Acute and New Admission and 1 Bad and Delirious. The remaining 2 wings are set apart for males and consist of 7 wards, *viz.*,—2 Convalescent and Improving, 2 Acute and New Admission, 2 Bad and Delirious, and 1 Pneumonic. The upper has got 3 wards consisting of 12 beds reserved for non-plague cases, *viz.*,—4 Beds Fever under observation, 4 Relapsing Fever, and 4 other diseases. These lower wards are so well constructed and raised on the roofed verandahs that both light and air are freely admitted, and they can be moderated also if desirable.

The Office and the Dispensary are situated near the gate, while the quarters for the Hospital Staff and the Contacts are on the west of the oblong and on the gate buildings. The sites for the visitors and the friends of the sick are on the open verandah on moveable benches under temporary roofs covered by creepers in the passage.

The beddings, clothes and dressings of plague patients are burnt in one corner of the open square situate in the north-east direction of the hospital. This square is situated on the back part and is quite aloof from the hospital building.

4. *Conservancy.*—There is but one latrine with two seats only. It is situated in a quite separate corner and in its own compound. It is on the north-west of the oblong-open-verandah. It is used by the Hospital Staff and the Contacts. The sewage is removed daily four times by a halalkhore residing in the hospital compound to a night-soil depôt in the Ardesher Dady Sheth Street, Falkland Road, Null Bazaar. Two commodes are placed—one for the male Convalescent Improving patients and another for similar female patients at the end of their respective ward-wings on a specially prepared spot with moveable curtains forming four sides. The contents of the commode are disinfected and removed by a halalkhore on duty to the latrine where it is collected and the commode is washed and disinfected. Besides these commodes, several bed-pans are kept ready near the commode-spot and in the Acute and the bad wards. Here the ward servant has to hand over the bed-pan when the patient has passed stools in it to the halalkhore on duty, because halalkhores are not permitted to enter wards. The bed-pan and its contents undergo the same process of disinfection and washing as in the case of the commodes. Corrosive Sublimate solution (1-1,000) is used for disinfection and for washing these pots.

The clothes are kept soaked for one day in water in a large wooden tub placed at one corner of the open-oblong-verandah. The Corrosive Sublimate solution is added to the water. They are then washed with water, dried, and lastly given to dhobi for better washing.

5. The Hospital water-supply is entirely derived from the Vihar-water-main.

6. Wards and other buildings are disinfected by lime with Corrosive Sublimate solution.

Phenyle solution is used to disinfect the latrines and commode spots.

The kits of the contacts were sent four times to the Modikhana Disinfecting Station with a Hospital servant. Twice they were disinfected and twice they were returned not disinfected.

7. The body of a dead person is first washed with water containing Carbolic Acid solution (1-20), and then it is wrapped up in a sheet of cloth soaked in Corrosive Sublimate solution. The dead are conveyed by their relatives and friends to the Sonapur Cemetery and cremated according to the current Hindu way. Only in four unclaimed cases a Municipal cart removed their dead bodies to a cemetery for disposal.

8. There was not a single case of plague, previously inoculated with Prof. Haffkine's prophylactic, admitted into the hospital.

Temperature on admission is commonly above 102° F. It rises by 1° or 2° to about 105° F. in about 2—4 days. Its height is maintained for about 3—7 days. It begins to fall generally by lysis, reaching its subnormal level in about 6—15 days. The critical falls in temperature are sometimes observed even in cases of recovery. The subnormal level is commonly by 1° or 2°, and is kept up for about 6—30 days, or even longer. The morning remissions in temperature are generally from about 1° to 2°. Critical rises and falls are commonly dangerous. The maximum temperature observed is 106° F. and the minimum 101° F.

Delirium commonly occurs after 2—5 days. It is a common symptom and generally not a bad one. Some ideas either of a personal or domestic, or business, or depressive character take a firm hold upon his mind. They are not given out at



random, but he holds them and gives them out most systematically and with obstinacy. At the height of the disease the sense of weakness seems to leave him, he rises in bed or even gets up and runs away. This symptom is very characteristic.

Bubo appears commonly within 2 or 3 days after the onset of the disease.

During the acute stage of the disease, one or more secondary buboes appear on the corresponding side of the body. In bad cases sometimes a series of buboes commence developing in about 2—3 days after the appearance of the primary bubo on all the favourite seats of buboes. These cases soon end in death.

Buboes in the submaxillary regions are most fatal because œdema of the glottis very soon supervenes. Iliac as well as parotid buboes are dangerous.

Retention of urine is a common symptom, and suppression of urine is not commonly met with.

Abortion in a pregnant female if affected with an acute type of plague is very common.

Diarrhœa is a rare thing from the commencement of the disease, and when met with, shows the case is growing serious. Similarly is hemorrhage from the bowels, which may occur after 3—6 days from the onset of the disease and is dangerous. Epistax is also serious, but is not so bad as malaena in respect to prognosis.

Eyes if inflamed may result in—

Conjunctivitis.

Iritis.

Keratitis.

Panophthalmia.

Lungs. Inflammation may be primary or secondary, the former is plague pneumonia and the latter plague complicated with pneumonia, and commonly is of a Catarrhal character. Hypostatic pneumonia is not rare. In bad cases ending in death, the following are observed :—

Local abscesses.

Local ulcers.

Peritonitis. Generally it is localised and is met with in iliac buboes.

Sequelæ of the disease as met with, are as follows :—

Arthritis.

General debility.

Dysentery, Diarrhœa.

Period of convalescence is from 3 weeks to 3 months and upwards.

There was no case of mumps mistaken for plague admitted into the hospital. There was no case of Plague complicated with any other disease admitted into the hospital. Cases of fever *under observation* were 17 in number, and all of them of malarious type but one. They were of a remittent and intermittent character, *viz.*, four were complicated with bronchitis, three with hepatic congestion, five were of intermittent type and the rest of simple remittent type and one was of Dysentery. All got cured and were discharged.

Nursing and Feeding are most important elements in treatment. Internally the administration of Stimulants both General and Cardiac as Alcohol, Ammonia, Strychnia, Caffeine, Digitalis, of Sedatives and Hypnotics as Bromides, Hyoscyanin, Morphine, Sulphonal are of extreme service. Depressant diaphoretics are most dangerous and therefore should never be used.



At the very early commencement of the appearance of a bubo pain or tenderness, the application of Ice bag or of Empl. Ammon. C. Hydrarg. with poulticing is useful. When the bubo is ripe it is opened with all due anti-septic precautions and dressed anti-septically or poulticed if required. After-treatment is ordinary as in all surgical cases.

I have observed that *Lansonia Alba* (Mythracac) has got some peculiar properties to moderate suppuration and other inflammatory processes in the parts. It is largely used in this hospital after the bubo is opened. It is found to expedite the healing in the parts. Its leaves if fresh and green are pounded up with a few drops of water, and applied in the form of a poultice between the two layers of a muslin cloth, and if dry are finely powdered and made into a poultice with water and similarly applied. This poultice is changed twice morning and evening. This plant is known in Hindi, Gujrati—as Mendi. It is a common plant and used largely by Vaid, Hakims in boils as an external application.

Amongst the hospital staff all enjoyed good health excepting the cook. He was on the 5th March 1899, laid up with a mild Bubonic Plague and it ended in recovery. The source of contagion is probably from his room, because he got plague within the week he commenced to live in his own room, at Kalbadevi Road C Ward. He was in service (hospital) for 6 months and resided and slept in the hospital premises, all through excepting the period when he got plague.

During the year the number of the contacts was 103 and they were free from plague excepting one, Sunderji Jivan, a Luvana by caste. He got plague on the 8th October 1898, and was transferred to the Luvana Hospital, Thakurdwar Road, C Ward. He was cured and discharged.

TABLE I.—Total admissions during the year, 303.

Months.	Plague.	Relapsing Fever.	Observation cases including all general diseases.	Total.
	Remained in Hospital on 1st June 5			
June 1898 ... ..	2	.....	2	9
July „ ... ..	9	... ..	3	12
August „ ... ..	12	.....	3	15
September „ ... ..	21	.....	3	24
October „ ... ..	24	.....	2	26
November „ ... ..	15	.....	3	18
December „ ... ..	13	.....	.....	13
January 1899 ... ..	34	.....	1	35
February „ ... ..	78	.....	.....	78
March „ ... ..	47	.....	.....	47
April „ ... ..	21	.....	.....	21
May „ ... ..	5	.....	.....	5
Total ... ..	286	.....	17	303

11. Largest number of admissions 3rd week of February 1899 (from the 18th to 24th February ... .. 26
- Largest number of admissions on 20th February 1899 ... .. 7
12. Total number of deaths during the year ... .. 200
- Total number of deaths from Plague during the year ... 200
- Total number of weekly deaths ... .. 200
- Total percentage of deaths to admissions ... .. 66·006
- Largest number of deaths 21st February 1899 ... .. 7

TABLE II.

	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague ... ..	286	200	84	69·93
Relapsing Fever ... ..	.....	.....	.....	.....
Observation and other diseases ... ..	17	.....	17	<i>Nil.</i>
Total ...	303	200	101	66·006

TABLE III.

Months.	Total admissions.	Died within 24 hours.	Died within 48 hours.	Total Deaths.	Total Recoveries	Percentage of Deaths.
	Remained in Hospital on 1st June } 5					
June 1898 ...	2	1	1	2	4	28·57
July „ ...	9	2	1	4	2	40·
August „ ...	12	5	.....	10	3	62·5
September „ ...	21	5	4	14	1	58·33
October „ ...	24	5	9	19	8	57·55
November „ ...	15	5	3	8	5	38·09
December „ ...	13	5	.....	11	5	52·38
January 1899 ...	34	10	6	23	4	58·97
February „ ...	78	22	11	52	10	57·7
March „ ...	47	13	9	38	28	50·6
April „ ...	21	6	2	14	9	46·6
May „ ...	5	2	.....	5	5	41·6

TABLE IV.

Caste : Hindoos.	Total Admissions.	Deaths.	Recoveries.	Percentage of Deaths.
Males ... ..	721	180	89	66·42
Females ... ..	26	18	8	69·23
Children under 12 years ...	6	2	4	33·3

TABLE V.—Table showing the mortality for the year amongst Sexes and Children.

Total Mortality. for the year.	Mortality amongst the Men.	Mortality amongst Women.	Mortality amongst Children all under 12 years of age.
200	180	18	2

TABLE VI.—Table showing the situation of Buboes.

	MALE.			FEMALE.			Percentage of Mortality.
	Admitted.	Recovered.	Mortality.	Admitted.	Recovered.	Mortality.	
Cervical ...	5	3	2	3	...	3	62.5
Parotid ...	3	2	1	...	...	...	33.3
R. Axillary ...	27	11	16	3	2	1	56.6
L. do. ...	18	6	12	2	1	1	65.
R. Femoral ...	47	8	39	7	2	5	81.407
L. do. ...	39	12	26	4	2	2	65.11
R. Inguinal ...	19	10	9	2	...	2	52.38
L. do. ...	18	4	14	2	1	1	75.
Multiple Buboes ...	30	5	24	3	1	2	78.78
Subtrochlear (elbow joints) ...	1	1	...	1	1	...	Nil.
Upper arm (inner side) ...	1	1	...	...	...	...	Nil.

TABLE VII.—Table showing Pneumonic Plague (without Buboes).

Sex.	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ...	17	13	4	76.47
Females ...	...	...	...	...
Children ...	...	...	...	...

In no case of Pneumonic Plague, was bacteriological examination of the sputum of the patient made.

Cases that recovered were of the mild pneumonic plague type.

TABLE VIII.—Table showing cases of Secondary Plague Pneumonia (complicated with Buboes).

Sex.	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ...	33	26	7	78.78
Females ...	1	1	...	Cent. per cent.
Children ...	...	...	...	...

There was no bacteriological examination made in any case.

Secondary pneumonia of a catarrhal type supervened in 15 cases in about 4—15 days after the admission into the hospital and seven recovered.

Secondary pneumonia supervened in 16 cases in about 3—10 days after the admission into the hospital and all proved fatal.

Secondary pneumonia of a croupous character supervened in three cases in about 2—7 days and they proved fatal.

All of these cases were of acute Bubonic Plague type.

MAGANLAL U. BHATT,

Medical Officer in Charge

The Jain Plague Hospital.

17th July 1899.



*Notes by the Special Medical Officer.*

This hospital is situated in a very densely crowded part of the City, and was of its kind airy and commodious.

No. 23.

**The Kshatriya Fever Hospital, Charni Road Gardens.**

I. The Kshatriya Fever Hospital, in the Churni Road Gardens, was opened on the 1st February 1899, and closed on the 1st June 1899. Report, therefore, relates to four months.

II. The Hospital was founded by the Kshatriya Community for patients belonging to that community. It was maintained by private subscriptions, and by funds belonging to that community.

THE NAMES OF THE COMMITTEE.

*Chairman.*

Mr. Shamrao Manikji Rele, High Court Pleader.

*Secretaries.*

Mr. Madhaorao Shreeder.

,, Chintamani Atmaram Rele, B. A., LL.B.

*Treasurer.*

Mr. Madhaorao Shreedher.

*Members.*

Mr. Gangaram Bapasoba Rele, J.P., B.A., LL.B.

,, Gopinath Krishnaji.

,, Ramrao Shreedher.

,, Purshottam Bhai.

*The Chief Medical Officer.*

Dr. Trimbak Dinkar Welankar, B. Sc., L.M. & S.

*List of Medical Staff.*

Mr. Shankar Sadashive Gokhale—*Hospital Assistant.*

Bhagoobai Bhaleravin—*Nurse.*

Vishnu Balaji Shevde, } *Ward-boys.*  
Ganpat Narayan Potdar, }

One Ramoshi.

III. One plague ward divided into two compartments, one for male patient, and the other for female patients. The whole ward is intended to accommodate twenty patients. Patients were kept with screens between them. Dispensary, Office Room, Servants' Quarters and Store Room were located on one side of the Plague Ward, and on the other side were Observation and Convalescent Wards, next to these being Contact Sheds. There was one ward for delirious patients. Contacts sheds were occupied by nearly 40 persons at different times.

IV. Two halalkhors were lent by the Municipality. There were two latrines. Sewage was daily removed by halalkhors.

V. The Municipality had been good enough to give a pipe near the hospital premises.

VI. All the sheds in the hospital were disinfected by ward-boys with phenyle and carbolic powder.

VII. The dead were removed to a mortuary which was situated at a distance from the Plague Ward and it was big enough to accommodate 4 bodies. The dead were removed and cremated by their relations.

VIII. None of the patients were inoculated.

IX. None of the staff of the hospital died, and none were attacked with plague.

TABLE I.—*Total Admissions during 4 months.*

Months.	Plague.	Relapsing Fever.	Observation cases including all General Disease.	Total.
February ... ..	3	None.	None.	3
March ... ..	9	None.	None.	9

X. The largest number admitted was in the month of March during the second week.

XI. The total number of deaths from plague ... .. 11

Total number of deaths ... .. 11

TABLE II.

—	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague ... ..	12	11	1	91·6

TABLE III.

Months.	Total Admissions.	Died within 24 Hours.	Died within 48 Hours.	Total Deaths.	Total Recoveries.	Percentage of Deaths.
February ...	3	1	2	3	...	91·6
March ...	9	4	2	8	9	...

TABLE IV.

—	Total Admissions.	Deaths.	Recoveries.	Percentage of Deaths.
Males ... ..	8	7	1	87·5
Females ... ..	2	2	.....	100·0
Children (under 12 years)...	2	2	.....	100·0

One Brahmin was admitted by way of exception, and he died ; the rest belonged to the Kshatriya community.

TABLE V.

Total Mortality for 4 Months.	Mortality amongst Men.	Mortality amongst Women.	Mortality amongst Children (under 12 years.)
11	7	2	2

TABLE VI.—*Showing the situation of Buboes.*

Situations.	Total Number of Cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of Mortality.
R. Axillary ...	1	...	1 child	1	.....	.....
L. Axillary ...	1	1	.....	1	.....	.....
R. Femoral ...	2	2	.....	2	.....	.....
L. Femoral ...	2	...	2	2	.....	.....
R. Inguinal ...	1	...	1 child	1	.....	91.6
L. Inguinal ...	2	2	.....	2	.....	.....
Black blister on ankle.	1	1	.....	.....	1	.....
Two buboes R. & L. Femoral.	1	1	.....	1	.....	.....

TABLE VII.—*Showing Pneumonic Plague without Buboes.*

—	Admitted.	Died.	Recovered.	Percentage of Mortality.
Male ... ..	1	1	.....	100

TABLE VIII.—Table of cases of secondary plague pneumonia (complicated with buboes). No such cases occurred in the above hospital.

## OBSERVATIONS.

Thoro was only one caso admitted into the hospital which recovered, and that was a mild case. The temperature in this case as a rule never went above 103° and no bubo was found, but a characteristic black blister was found on the inner side of the ankle.

The situations and localities of the buboes are given in Table VI. They appeared, as a rule, within the first three days of the attack, according to statements of the patients or their relations; these statements being sometimes at variance with one another. But no opportunity was found to watch a case in which the patient was admitted before the development of bubo and which afterwards developed it, and all the patients came in the hospital after the development of bubo.

In the few cases that were treated in the hospital, only one patient showed symptoms of violent delirium for one day before his death. Suppression of urine or any other organic diseases were not observed.

The treatment given at this hospital was on general principles. No special serum of any person being used. Ice bags, stimulants (brandy), nourishing digestible food (milk, conjee, &c.), diaphoretics, &c., were used in the course of treatment. Chief drug supposed to act as specific on plague, *viz.*, mercury perchloride and potassium iodide were used, but were not found to be of any special value as far as the experience of this hospital is concerned. Digitalis, ether, strychnia were often used for injection when necessary. Digitalis was also given internally as a cardiac tonic. Enemata were often ordered for the purpose of clearing the bowels where purgatives were considered undesirable according to the condition of the patient.

V. D. VELANKAR, B.Sc., L.M.&S.,  
Chief Medical Officer, in charge K. P. Hospital.

30th June 1899.

## REMARKS BY THE SPECIAL MEDICAL OFFICER.

This hospital was situated in the Charni Road garden facing the sea, and was well conducted.



### The Kokni Plague Hospital.

*Report of the Kokni Plague Hospital from 1st June 1898 to 31st May 1899.*

The hospital was opened on the 3rd of February 1899, at the request of Sirdar Khan Bahadur Mahomed Yacub, late District Officer of the Central District. I undertook to visit the patients and give medicine gratis.

The building is one-storeyed, the ground floor is used for stores and dispensary. The first floor is used for patients. There are three halls and three rooms. The rooms are used for female patients and the halls for male patients.

All the excretary matters were mixed with phenyle or carbolic lotion, and then allowed to pass in the drains.

As the patients admitted were generally poor and homeless, the clothes were generally destroyed by fire after recovery or death.

Water supply is derived from the water pipe supplied by the Municipality.

Every week the floors were disinfected with lime and perchloride of mercury lotion. The walls and the roof were disinfected once during four months.

As soon as a person is dead, the body is removed to the cemetery by the relatives, and in case of poor persons, they were removed by the servants of the Association called "Amwa-tay-la-Islamia."

None of the patients treated in this hospital were previously inoculated by Professor Haffkine's serum.

One of the Assistants suffered from plague, but he got the contagion from his own house where there were several cases of plague; he was removed to the Kutchee Memon Hospital where he recovered.

The cases were generally sent to the hospital several days after the onset of the attack, and as there were no friends or relations accompanying the patients, no particulars as to the period of incubation, symptoms, or progress could be obtained. The mild cases were seldom sent to the hospital. The temperature in all cases observed during the first five days of the disease was between  $101^{\circ}$  and  $106^{\circ}$  whether they recovered or not. In the majority of cases of recoveries, the buboes suppurated. As all the patients had buboes on when admitted, it is impossible to state whether they appeared before, with or after the fever. The axillary buboes were fatal, specially left axillary one. Some cases were complicated with brain symptoms, other with lung symptoms, others with diarrhoea, and the majority who died, died through failure of the heart.

*Treatment.*—The ordinary treatment I adopt is my native mixture specially prepared for plague with occasional doses of stimulants, but each case was treated on its own merits.

I have, &c.,

KHAYJA ABDULLAH, L.M.&s.,

Hony, Medical Officer in charge.

*List of Hospital Staff.*

Joosub	...	...	...	Hospital Assistant.
Shaik Esmail	...	...	...	Clerk.
Syed Imam	...	...	...	Ward-boy.
Ayshabai	...	...	..	Ayah.
Eatha Mella	...	...	...	Mehterani.

TABLE I.—*Total Admissions during the Year.*

Months.	Plague.	Relapsing Fever.	Observation Cases including all General Diseases.	Total.
February ... ..	7	Nil.	Nil.	7
March ... ..	13	Nil.	Nil.	13
April ... ..	6	Nil.	Nil.	6
May ... ..	1	Nil.	1	<u>2</u> 28

TABLE II.

Admissions.	Deaths.	Recoveries.	Percentage of mortality.
Plague ... ..	16	11	55.00
Relapsing fever ... ..	Nil.	Nil.	Nil.
Observation and other diseases ... ..	Nil.	1	Nil.
Total ...	16	12	55.00

TABLE III.

Months.	Total Admissions.	Died within 24 Hours.	Within 48 Hours.	Total Deaths.	Total Recoveries.	Percentage of Deaths.
February ... ..	7	2	1	3	4	42
March ... ..	13	5	2	9	4	69
April ... ..	6	1	1	3	3	50
May ... ..	1	.....	.....	1	Nil.	100

TABLE IV.

	Total Admissions.	Deaths.	Recoveries.	Percentage of Deaths.
Male ... ..	19	11	8	57
Female ... ..	6	4	2	66
Children under 12 years ...	2	1	1	50

TABLE V.—*Table showing the Mortality for the Year amongst Sexes and Children.*

Total Mortality of the year.	Mortality amongst men.	Mortality amongst women.	Mortality amongst children all under 12 years of age.
16	11	4	1

TABLE VI.—*Table showing the situation of Buboes.*

Situation.	Total Number of Cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of Mortality.
Cervical .. ..	4	2	2	4	Nil.	100
Parotid ... ..	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.
R. Axillary ... ..	2	1	1	1	1	50
L. Axillary ... ..	2	2	Nil.	2	Nil.	100
R. Femoral ... ..	5	8	1	1	4	25
L. Femoral ... ..	12	11	1	8	4	63
Other Situations .. ..	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.
No Buboes ... ..	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.
Multiple Buboes ... ..	2	2	Nil.	2	Nil.	100

TABLE VII.—*Table showing Pneumonic Plague (without Buboes).*

—	Admitted.	Died.	Recovered.	Percentage of Mortality.
Male ... ..	} Nil.	Nil.	Nil.	Nil.
Female ... ..				
Children ... ..				

TABLE VIII.—*Table showing Cases of Secondary Plague Pneumonia (complicated with Buboes).*

—	Admitted.	Died.	Recovered.	Percentage of Mortality.
Male ... ..	Nil.	Nil.	Nil.	Nil.
Female ... ..	1	1	Nil.	100
Children ... ..	Nil.	Nil.	Nil.	Nil.



**Report of the "Vasanjee Tricumjee" Hospital,  
Bombay, from the 1st June 1898 to 31st May 1899.**

*History of the foundation of the Hospital.*

The Vasanjee Tricumjee Plague Hospital for the Dassa Oswal Banias was first opened in March 1897, its want being sadly felt during that time. On the first outbreak, there was a general panic amongst the natives, and a strong feeling and prejudice arose against the patients being treated at Municipal hospitals. The name of the Arthur Road Municipal Hospital was a dread to many people, and they declined to go to it with the result that the plague spread in Mandvi and other parts of the city with great force and virulence. In consequence of this false dread against the Arthur Road Hospital, against which they loudly clamoured, they secreted many cases which resulted in untold mischief. An appeal was made by H. E. Lord Sandhurst to the leaders of native community, and it was in response to this appeal that at this stage Seth Vasanjee Tricumjee of his own accord and intention came to the rescue of the people, and offered to start and maintain an hospital for the Dassa Oswal community. The spontaneous movement was at once warmly approved by General Gatacre, who complimented Seth Vasanji Tricumjee on his laudable and generous spirit in coming to the succour of the authorities as well as the people. As soon as the hospital was opened, all the troubles disappeared, and the people having great confidence in Seth Vasanjee, who is loved by them on account of his kindness and benevolence, went to the hospital willingly as the first symptoms of fever manifested themselves. The hospital was maintained at a heavy cost and proved a boon not only to the Dassa Oswals, but the members of the Brahmin caste also, who availed themselves of it when attacked by the insidious and invisible foe—the plague. Seth Vasanjee spared neither pains nor money to make the hospital attractive, useful, and as popular as possible. Everything that money and science can do to save the lives of the people was done. When poor patients were discharged cured, Seth Vasanjee gave them new clothes and money to start life again; this and other kind considerations, combined with the personal exhortations of Seth Vasanjee, induced the people to go to the hospital, which was in the heart of the native town Mandvi where the plague played most havoc, and committed ravages awful to contemplate. The hospital was visited by H. E. Lord Sandhurst, Sir A. Wingate, Sir Charles Ollivant, the Hon'ble Mr. Nugent, Surgeon-General G. Bainbridge, Surgeon-Major H. P. Dinmock, Lieut. Brackenbury, Dr. J. A. Britto, S. R. Hutchinson, Sir J. W. Campbell and many others, who were all pleased with the arrangement made in the hospital which showed what success a popular leader like Seth Vasanjee can achieve over the members of his community by setting a noble example and persuading them to go to the hospital. This institution, from its earliest commencement, became so popular that its example was followed by high class persons of other Hindu castes also. Seth Vasanjee Tricumjee Muljee thus succeeded in gaining the confidence of his people, who in return laid aside all prejudices and imaginary fears and rushed to the hospital at the earliest symptoms of the disease.

The hospital, as stated above, was founded in March 1897, when, after doing excellent work for four months and-a-half, was closed during the monsoon. It re-opened with the second epidemic on the 1st of December 1897, to be closed on 31st May 1898. On the recurrence of the third epidemic, it was once more opened on February 14th, 1899, to carry on its noble work, which it still continues to do.

All through the three years the whole expense of the hospital has been defrayed solely by its generous founder Seth Vasanjee Tricumjee, by which noble deed he has won the lasting gratitude of the public.

*List of Staff.*

The sole owner and contributor of this Hospital is Rao Saheb Seth Vasanjee Tricumjee Muljee, J.P., the head of the Dassa Banias.

*Managers.*

1. Raisi Lakhumsec.
2. Khatsy Latha.

*Supervisor.*

Govindjee Sewjee.

*Medical Officers.*

From 14th February to 13th April 1899.

Dr. R. P. Kuthar.

From 14th April 1899 till present date.

Dr. D. C. Sethna, M.B., C.M. (Edin.), etc.

*Hospital Assistant.*

Mr. B. D. Chatterjee.

*Menials.*

- 5 Ward-boys.
- 1 Sweeper.
- 1 Dhobie.
- 1 Peon or Chaprasee.

3. This Hospital is situated in Clive Road, Mandvi. It is a one-storeyed building well situated in the corner of a street, so that it commands a respectable appearance. It is open on the North, East and West sides altogether; on the South there is an adjoining building. The ground floor is occupied by the dispensary in one room, and another large hall left vacant, but a part of it is converted with a small kitchen for the private use of the Hospital patients. The top floor consists of one very large and another small room. The small room is set aside as a female ward, and holds from 6 to 7 beds. The large room is given up for the exclusive use of male patients, and is the male ward of the Hospital. It holds from 24 to 25 beds easily. Both these rooms are open and very freely ventilated, having four large windows on each side. The rooms are very airy and well meant for hospital purpose.

The dispensary, as stated above, is in the smaller of the two rooms in the ground floor.

Servants' quarters are not in the premises, but they live in other houses not very far from the hospital.

4. *Conservancy*—Latrine, having one seat and worked according to the latest sanitary principles; and urinals.

Clothes that have been soiled by fœcal evacuations are burnt, but those that have been very slightly soiled are first disinfected thoroughly by carbolic lotion then dried, and then sent to the dhobies.

Kerosine oil we consider very satisfactory for disinfecting the clothes that have been soiled; as it seems to have a powerful destructive influence over the plague bacilli.

The old dressings of the buboes are always first saturated with kerosine oil and then burnt, so as to be perfectly certain of avoiding contagion by that means.

5. *Water-supply* is from the general pipes taken into the buildings from the street.

6. *Disinfection of Wards and other buildings*—Every ward is daily sprinkled with a weak solution of phenyle before the ground is swept. Whenever any place was made dirty by a patient or otherwise, it was washed with phenyle, allowed to dry for some time, then white-washed with chunam. Whenever pillows, bed sheets, clothes, were much soiled with urine or evacuations they were always burnt.

Other clothes etc., which needed disinfection were sent to the District Officer (Ward), with a note to the purpose, to be disinfected by the Steam Disinfector. These were carefully returned in about 4 to 5 hours, after which they were handed over to the dhobies.

*Disposal of the Dead.*

7. When a patient died, he was removed to one corner of the room which is set apart for the purpose, and screened from the view of other patients. Here it may lie for about half an hour to an hour, when the relatives remove the corpse to the ground floor for the purpose of washing the body and performing a part of the funeral rites. The body after death is as a rule cleared within 2 to 3 hours from the hospital premises.

No pauper patients ever came to the hospital. All had relations who claimed the body soon after death.

8. No special record kept of Haffkine's serum inoculation in the case of the first 18 patients; but during the treatment of the present doctor, it has been discovered that not a single patient, who came to the hospital was ever inoculated within these last 3 or 4 years.

9. There was no sickness amongst the staff of the hospital.

TABLE I.

10. Total Admissions during the year 25.

Months.	Plague.	Relapsing Fever.	Observation Cases.	Total.
14th to 28th February 1899...	7	.....	.....	7
1st to 31st March „ ...	10	.....	1	11
1st to 30th April „ ...	6	.....	.....	6
1st to 31st May „ ...	.....	.....	.....	.....
1st to 30th June „ ...	1	.....	.....	1
Total ...	24	.....	1	25

11. The largest number of admission during a week was 6 in the week ending 25th February 1899. The particular day on which the largest number came in was 28rd February 1899, the admitted number being 3.

12. Total number of deaths during this year is 19, out of this number 18 died of plague.



*Total Weekly Deaths with Percentage of Deaths to Admissions.*

During week ending Saturdays of	Admissions.	Deaths.	Percentage of Deaths to Admissions.
18th February 1899 ... ..	1	.....	.....
25th " " " " " "	6	2	33·0
4th March " " " " " "	.....	2	.....
11th " " " " " "	4	3	75·
18th " " " " " "	1	2	.....
25th " " " " " "	4	3	75·0
1st April " " " " " "	2	1	50·0
8th " " " " " "	2	3	.....
15th " " " " " "	1	1	100·0
22nd " " " " " "	1	.....	.....
29th " " " " " "	2	.....	.....
6th May " " " " " "	.....	1	.....
13th " " " " " "	.....	.....	.....
20th " " " " " "	.....	.....	.....
27th " " " " " "	.....	.....	.....
3rd June " " " " " "	.....	.....	.....
10th " " " " " "	1	1	100·0
17th " " " " " "	.....	.....	.....
24th " " " " " "	.....	.....	.....
1st July " " " " " "	.....	.....	.....

There was only 1 death on any particular day except on the 6th April 1899 when 2 deaths occurred.

TABLE II.

	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague ... ..	24	18	6	75·0
Relapsing fever ... ..	.....	.....	.....	.....
Observation and other diseases ...	1	1	.....	100·0
Total ...	25	19	6	76·0

TABLE III.

Months.	Total Admissions.	Died within 24 Hours.	Within 48 Hours.	Total Deaths.	Total Recoveries.	Percentage of Deaths.
February ...	7	1	1	4	1	57·1
March ...	11	2	2	9	2	81·8
April ...	6	...	1	5	1	83·3
May ...	.....	...	...	...	1	.....
June ...	1	1	...	...	1	100·0
	25	4	4	19	6	76 per cent.

No relapsing fever case.

TABLE IV.

Total Admissions.	Deaths.	Recoveries.	Percentage of Death.
Male ... .. 19	14	5	73·7
Female ... .. 5	4	1	80·0
Children (under 12 years) 1	1	...	100·0

Being exclusively a Hindoo hospital, patients of no other community were received in it.

TABLE V.—Table showing the mortality of the year amongst sexes and children.

Total Mortality for the Year.	Mortality amongst Men.	Mortality amongst Women.	Mortality amongst Children all under 12 Years of Age.
19	14	4	1

TABLE VI.—Table showing the Situation of Buboes.

	Total No. of Cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of Mortality.
Cervical ... ..	1	.....	1	1	.....	100·0
Parotid ... ..	.....	.....	.....	.....	.....	.....
R. Axillary ... ..	2	1	1	1	1	50·0
L. Axillary ... ..	2	2	.....	.....	2	No death.
R. Inguinal ... ..	4	4	.....	4	.....	100·0
L. Inguinal ... ..	9	8	1	7	2	77·3
R. Femoral ... ..	.....	.....	.....	.....	.....	.....
L. Femoral ... ..	.....	.....	.....	.....	.....	.....
Other situations ... ..	.....	.....	.....	.....	.....	.....
No Buboes ... ..	3	3	.....	2	1	66·6
Multiple Buboes ... ..	4	2	2	3	1	75·0

TABLE VII.

There were no cases of Pneumonic Plague without buboes.

TABLE VIII.

There was only 1 male case of Secondary Plague pneumonia complicated with a bubo. The pneumonia supervened on the third day of admission. The patient recovered eventually.

*Notes on the symptoms, character and treatment of the disease.*

*Fever.*—The temperature of an acute case ending in recovery was as follows:—

The patient—a boy 18 years old—was admitted on the second day of his attack when the temperature was 102·5. The same evening it rose to 103·6° F. On the second day of admission it ran up to 105·8° F. It came down a little in the evening and rose again on the following morning to 105·6. It oscillated so for four full days, that is, till the fifth and sixth day of the attack. Then on the eighth morning it fell from 102·2° to 98° F. It rose to 102° again on the tenth day and remained so till the fifteenth day, from which date there was the morning fall (up to 99°) and evening rise (up to 102° F.) of temperature till the thirtieth day of his admission. Then from the thirty-third day it became slightly sub-normal 98° F. and remained so for another fortnight, after which it became quite normal.

The maximum temperature noticed, as a rule, is 105° F., the minimum 95·5 to 96.

*Buboes.*—Buboes are generally found in the inguinal regions, and that also more common on the left than on the right side. As a rule, at first one small is felt, when the adjoining glands also soon become involved, and then assume a big mass.

Generally they begin on the second or third day of the attack, in some cases they exist from the very commencement. They suppurate or subside after the first 6 or 7 days.

The most fatal form of buboes are those which are situated in the cervical region, as the pressure caused by them on the trachea and œsophagus soon prevent nourishment, medication and free breathing. Next in order are the inguinal glands, the somewhat hopeful ones are those of the axillæ.

Men are more liable to the attack of plague than women, but the mortality is higher in women than in men.

Further, mortality amongst pregnant women is exceedingly high, even 96 to 97 per cent. It causes abortion at first, to be soon followed by the death of the patient.

The statistics of this hospital proves the disease commoner in men than women.

*Period of Convalescence.*—Convalescence begins from about the tenth day, and it is very slow, sometimes very much protracted on account of suppuration of the glands.

We have never mistaken mumps for plague nor *vice versa*.

*Remarks by the Special Medical Officer.*—This Hospital was one of the best of its kind, being isolated to a great extent, and it had large airy wards and contiguous to no overcrowded locality. It was always well conducted and useful.

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No. 26

### **Bhattia Plague Hospital, Mint Road.**

The hospital was opened on the 16th March 1897.

- |  |                                    |
|--|------------------------------------|
| 1. Govindjee Thakarsi Muljee.                                    | } <i>Secretaries and Chairmen.</i> |
| 2. Mawjee Shamjee Ladha.   |                                    |
| 3. Rao Saheb Purshotum Odhawjee, J.P.                            | } <i>Managers.</i>                 |
| 4. Sunderdas Dosa.   |                                    |
| 5. Chatoorbhooj Morarjee.  |                                    |
| 6. Morarjee Nensi.   |                                    |
| 7. Ranchoddas Haridas.   |                                    |
| 8. Madhawjee Virjee Solicitor.                                   |                                    |
| 9. Kalyanjee Valjee.   |                                    |
| 10. Purshotam Narayanjee.  |                                    |
| 11. Kanjee Meghajee.   |                                    |
| 12. Lakhamidas Nathoo.   |                                    |
| 13. Narotam Ramjee.  |                                    |
| 14. Kalyanjee Omarsi.  |                                    |
| 1. Dr. Purshotam Harichand, L. M. and S., Chief Medical Officer. |                                    |
| 2. Gordhandas Haridas, Native Hakim.                             |                                    |
| 3. Shivram Ramchandra Gupte, Hospital Assistant.                 |                                    |

The hospital will be closed on the 1st July 1899.



TABLE I.—*Total admissions during the year (1st June 1898 to 31st May 1899).*

Months.	Plague.	Relapsing Fever.	Observation cases including all general diseases.	Total.
1st June 1898 to 31st May 1899 ... ..	141	Nil.	11	152

Twelve cases were admitted during the week from 18th February 1899 to 25th February 1899, and during the same week 4 cases were admitted on the 23rd day of February 1899.

There were altogether 106 deaths during the year from 1st June 1898 to 31st May 1899; total number of deaths from plague was 100. The number of deaths during the week from 18th February 1899 to 25th February 1899 was 8 and the percentage of deaths to admissions was 66. There were 3 deaths on the 8th February 1899.

TABLE II.

	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague ... ..	141	100	41	70·8
Relapsing fever ... ..	Nil.	Nil.	Nil.	Nil.
Observation and other diseases ... ..	11	6	5	54·0
Total ... ..	152	106	46	

TABLE III.

Months.	Total Admis- sions.	Died within 24 hours.	Within 48 hours.	Total Deaths.	Total Reco- veries.	Percentage of Deaths.
1st June 1898 to 31st May 1899 ... ..	152	28	78	106	46	69·0

TABLE IV.

	Total Admissions.	Deaths.	Recoveries.	Percentage of Deaths.
Males ... ..	100	75	25	75
Females ... ..	43	26	17	60
Children under 12 years.	9	5	4	44

TABLE V.—*Table showing the mortality for the year amongst sexes and children.*

Total mortality for the year.	Mortality amongst the Men.	Mortality amongst the Women.	Mortality amongst children all under 12 years of age.
106	75	26	5

TABLE VI.—Table showing the situation of Buboes.

	Total number of cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of Mortality.
R. Axillary ...	21	12	9	18	3	85
L. Axillary ...	23	15	8	22	1	95
R. Femoral ...	18	11	7	16	2	87
L. Femoral ...	22	10	12	14	8	63
R. Inguinal ...	26	14	12	16	10	61
L. Inguinal ...	16	7	9	7	9	43
No Buboes ...	2	1	1	2	Nil.	100
Multiple buboes ...	5	3	2	Nil.	5	Nil.
Other situations ...	8	5	3	5	3	62

TABLE VII.—Table showing Pneumonic Plague (without Buboes.)

	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ...	Nil.	Nil.	Nil.	Nil.
Females ...	"	"	"	"
Children ...	"	"	"	"

No. 27.

### 1. Report on the Bhois' Plague Hospital, Bombay, from the 11th of January 1899 to the 17th of April 1899.

2. As no private Hindu Plague Hospital would admit Bhoi plague patients, Lt. G. Warneford, District Officer, C. Ward, and myself thought that a small hospital for Bhois if opened in their caste dining house in I Bhoivada, Bhuleshwar, would be the means of bringing together and isolating Plague cases, and in this way putting a stop to wholesale concealment of cases amongst them, which prevailed during the previous epidemics. The Deputy Commissioner approved of the District Officer's suggestion and the Bhois' Hospital was opened on 11th January 1899.

To the sum of rupees ninety (Rs. 90), subscribed by the Bhois, were added rupees two hundred (Rs. 200) from the Discretionary Relief Fund, put at the disposal of the District Officer, C. Ward, by a special order from the Plague Commissioner. A further donation of rupees twenty-five (Rs. 25) was received from the Chevli Bhunsalis, who were pleased with the admission and successful treatment of one of the women of their caste, who would have been removed to a Municipal hospital in absence of the above hospital. Rao Saheb Purshotum Odhuvji, J. P., and Messrs. Runchhoddas B. Shroff, Chairman of Volunteer Committee No. IV section, Bhuleshwar C. Ward, as well as Mr. Mohanji Pranjiwandas, Deputy Chairman, No. V Volunteer Committee, Bhuleshwar, C Ward, also presented beddings, blankets, bed-sheets, &c., to the hospital.

I was in charge of the hospital, and a Bhoi servant acted as Ward-boy, who was assisted for about a month and-a-half by a watchman.

3. The hospital was in a 3-storeyed building, the ground floor of which was used for contacts, the first storey was used for acute cases, the second for convalescent patients, and the 3rd storey, a loft, was the store-room. The Bhoi servant lived on the ground floor. All prescriptions, etc., were dispensed at the Bhuleshwar Pharmacy.

4. A Bhungi was told off for duty (morning and evening) at the hospital by Inspector C. Ward, H. D., who removed the excreta, which were collected in earthenware chatties. The clothes were burnt in almost all cases and the bed-sheets, &c., were washed at the Modh and Porwad Hospital by their hospital Dhobie.

5. The water supply was from the Vehar Water Works.

6. Phenyle, Mercuric Perchloride, and Dry Carbolic Powder were the disinfectants used.

7. The dead bodies were removed to the Sonapur cemetery and cremated there.

8. None of my patients were inoculated with serum.

9. No sickness occurred in any of the staff.

TABLE I.

10. Total admissions in the hospital.

Months.	Plague.	Relapsing Fever.	Observation cases, &c.	Total.
January 1899 ... ..	2	.....	.....	2
February „ ... ..	9	.....	.....	9
March „ ... ..	7	.....	2	9
April „ ... ..	.....	.....	.....	.....

11. The largest number of admissions was in the latter part of February and the commencement of March 1899. Not more than 2 patients were admitted on any day.

12. The total number of deaths during the period under report was thirteen (13).

There were not more than 2 deaths on any one day.

TABLE II.

—	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague ... ..	18	12	6	66·60
Observation Cases and other diseases ... ..	2	1	1	50·00
Relapsing Fever ... ..	.....	.....	.....	.....

TABLE III.

Months.	Total admissions (Plague.)	Died with- in 24 hours.	Died with- in 48 hours.	Total Deaths.	Total Recoveries.	Percentage of Deaths.
January 1899... ..	2	.....	.....	1	.....	50·0 per cent.
February „ ... ..	9	3	1	7	2	77·7 per cent.
March „ ... ..	7	1	2	4	2	55·5 per cent.
April „ ... ..	.....	.....	.....	.....	2	.....



TABLE IV.

All Hindus. 14 Bhois. 1 Marwari. 1 Bhunsali. 2 Other Castes.

( *Plague only* )

	Total admissions.	Deaths.	Recoveries.	Percentage of Deaths.
Males ... ..	3	3	.....	100 per cent.
Females ... ..	9	4	5	44·4 do.
Children under 12 years ...	6	5	1	33·3 do.

TABLE V.

Total mortality for the period.	Mortality amongst the men.	Mortality amongst the women.	Mortality amongst children under 12 years.
13	3	5	5

TABLE VI.—*Position of Buboes.*

Situation.	Total No. of cases.	Males.	Females.	Mortality.	Recovery.	Percentage of Mortality.
Cervical... ..	2	.....	2	2	.....	100 per cent.
Parotid... ..	.....	.....	.....	.....	.....	.....
R. Axillary ... ..	2	1	1	2	.....	100 per cent.
L. Axillary .. ..	1	.....	1	1	.....	100 do.
R. Femoral ... ..	1	.....	1	.....	1	.....
L. Femoral ... ..	3	1	2	1	2	33·3 per cent.
L. Inguinal ... ..	5	2	3	3	2	60 do.
R. Inguinal ... ..	1	.....	1	.....	1	.....
Other situations ...	.....	.....	.....	.....	.....	.....
No Buboes ... ..	3	.....	3	3	.....	100 per cent.
Multiple Buboes ...	.....	.....	.....	.....	.....	.....

TABLE VII.—*Pneumonic Plague without Buboes.*

	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	.....	.....	.....	.....
Females ... ..	1	1	.....	100 per cent.
Children ... ..	2	2	.....	100 do.

TABLE VIII.—*Secondary Pneumonia and Bubo.*

	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ... ..	1	1	.....	100
Females ... ..	.....	.....	.....	.....
Children ... ..	.....	.....	.....	.....

*N.B.*—No Bacteriological examination was made in any case. The secondary Pneumonia supervened 3 days after the appearance of fever and bubo, and was diagnosed from the physical signs, and the characteristic sputum.

The disease was most virulent in the latter part of February and the commencement of March 1899. The treatment was only symptomatic, stimulants being mostly indicated and used.

The dates of actual attack and infection could not be obtained, the patients being from an illiterate class; in one case the wife was attacked exactly 9 days after the death of her husband in the Churni Road Camp, the husband having died within 18 hours after the first manifestation of high fever and bubo. The maximum temperature noted was 105°8F. Cervical and axillary buboes proved the most fatal.

Brain symptoms were by far the most common complications. In only one case was the urine suppressed.

The period of convalescence is between a fortnight and a month and a-half after the first fall in temperature; in one case the convalescence was retarded by the appearance of another bubo in the groin, which subsided in four days with strong Lin. Iodi and fomentations, without any other trouble.

One case was kept under observation and found to be one of Hysteria.

No cases were treated by any kind of curative serum.

The treatment consisted of ice bags to the head and over the buboes and stimulants. Where the patient was delirious and sleeplessness prominent, Bromides were used. Milk diet and brandy were freely used. In two cases vapour baths were used, which quieted the patients for a few hours.

#### *History—*

The Hospital (Plague) for Bhois was started under orders from the Deputy Commissioner's Office, No. 4604 of 1898-99. Dr. D. R. Bardi was appointed Medical Officer. The first patient was received on 11th January 1899, and the last patient was discharged cured on 17th April 1899.

#### *Funds—*

The Bhois subscribed Rs. 90 amongst themselves, to which sum were added Rs. 200, placed at the disposal of the District Officer, C. Ward, from the Discretionary Relief Fund (Government) under orders from the Plague Commissioner in his No. 125 of 1898-99. The Chevli Bhunsalis also gave a donation of Rs. 25 to the hospital fund, pleased with the successful treatment of a woman of their caste, who was removed to the said hospital in absence of any hospital of their own.

The hospital was opened in the Bhois' Jamat house, situated in 1st Bhoiwada and it was arranged to treat plague patients of castes other than Bhois, when necessary, provided there was sufficient accommodation available, with the mutual consent of the Medical Officer (as a representative to the District Officer, C. Ward) and the chief men of the Bhois.

*Patients—*

Thus out of the twenty patients treated 14 were Bhois.

*Caste—*

1 was a Bhunsali,  
1 „ Marwari,  
3 were Kunsaras,  
and 1 was a Durji (tailor).

*Sex—*

Amongst the 20 patients ... 16 were females,  
and 4 „ males.

*Age—*

As regards age, out of 20 patients ... 1 was under 1 year of age,  
2 were between 1 and 5 years of age,  
3 were between 5 & 10 years of age,  
5 were between 10 & 20 years of age,  
6 were between 20 & 40 years of age,  
and 3 were over 40 years of age.

*Diseases—*

Out of 20 there were 18 Plague cases.  
1 Cholera „  
and 1 suffered from other Disease.

*Result of Treatment—*

Out of a total of 18 Plague cases 6 recovered and 12 died,  
„ „ 1 Cholera „ *nil.* „ „ 1 „  
„ „ 1 Other case 1 „ „  
so the percentage of recovery in Plague cases comes to 33·3.

*N. B.*—The Cholera case as well as 4 Plague cases (all of the Pneumonic type) died within 24 hours after admission into the hospital.

Rao Saheb Purshotum Odhuvji, J. P., and Messrs. R. L. Shroff and Mohunji Praujivundas presented many useful things to the hospital, and visited the hospital occasionally. The undersigned begs to acknowledge with thanks the assistance, co-operation, and suggestions from the gentlemen who took very great interest in the hospital.

BHOIWADA :  
Bombay 27th April 1899.

D. R. BARDI, L.M.&S.,  
Medical Officer,  
Bhois Hospital.



**1. Report on the working of the Bene-Israel  
Hospital, Bombay, from the 1st June 1898  
to the 31st May 1899.**

2. The Bene-Israel Plague Hospital is a communal hospital for Jews of all denominations—Bene-Israelites, Bagdadi and other Jews. It was opened on the 23rd February 1898, and has been kept open up to date.

*Committee.*

Mr. David Aaron	...	...	..	President.
„ Abraham Daniel	...	...	...	Vice-President
„ Elijah Solomon, B. A.	...	...	...	Honorary Treasurer.
Khan Sahib David Solomon	...	...	...	Honorary Secretary.

*Medical Staff.*

Dr. J. B. De Quadros, L. R. C. P., L. R. C. S. Medical Officer.

Mr. Ramkrishna Vithal Lad ... .. Resident Hospital Assistant.

*Staff.*

- 1 Nurse.
- 1 Storekeeper.
- 2 Ayahs.
- 1 Cook.
- 1 Peon.
- 1 Hamal.
- 1 Sweeper (Halalcore).
- 1 Maleo.
- 1 Ramosee.

The hospital was built from subscriptions and donations, and through the munificent donations of the late Baroness deHirsch, Baron Rothschild of Paris, some of the Bene clubs and congregations in America. The hospital was efficiently managed and conducted to the full satisfaction of every one.

It may be mentioned that the plague authorities were also pleased to sanction a grant of Rs. 600 towards the expenses of the hospital.

The Committee has also the pleasure to mention the name of the kind and philanthropic gentleman, Mr. M. N. Wadia, C.I.E., amongst the sympathisers of the hospital, who, with his usual generosity, through the instrumentality of Sirdar Khan Bahadoor Mir Abdool Ali of the Bombay Police, gave a donation in cash of Rs. 300 and clothes to the value of Rs. 150 to be distributed to the poor patients of this hospital.

3. The hospital is situated at Connaught Road, Byculla. There are fourteen blocks occupying  $1\frac{1}{2}$  acres of Municipal ground given to this hospital by the kind Municipal Commissioner, to whom the thanks of the whole Jewish Community are due.

The blocks are as follow :—

1. Acute Ward ... 1 block divided into two wards—one for the males and the other for the females; both accommodating 20 patients.
2. Convalescent Ward ... 1 block as above accommodating 8 patients.
3. Observation Ward ... 1 block as above accommodating 8 patients.
4. Mortuary ... 1 block of 3 rooms—one for washing the dead body according to the religious rites, the other for the performance of funeral rites and the third for the shelter of persons.
5. Dispensary and Store-room ... 1 block with 3 rooms.
6. Office ... 1 block.
7. Servants' Quarters ... 1 block of 4 rooms.
8. Contact Ward... 1 block of 6 rooms.
9. Segregation Camp ... 1 block of 10 rooms.
- 10-13. Health Camps ... 4 blocks of 20 rooms.
14. Bhangis' Quarters ... 1 block.

Health camps were built by the Municipality at the recommendations of Col. James S. Wilkins, D.S.O., I.M.S., Special Medical Officer, and J. H. DuBoulay, Esq., I.C.S., Deputy Commissioner for Plague Operations.

One room in the contact ward is given to each contact family as well as those removed to segregation camp and the health camps. These camps can accommodate nearly 150 persons at a time.

The contacts removed to the hospital were detained in the camp till the patient with whom they came was discharged; in cases of death, they were discharged after 10 days from the day of such deaths. Persons sent to the segregation and health camps were detained for fifteen days to one month, when they were allowed to return home. In all 453 persons passed through these camps, the peculiarity being that those who refused to come at first were most backward to leave.

4. *Latrines*.—Latrines consist of two blocks—one for contacts and the other for those in health camps. Each block has three seats. Excreta are removed to the night-soil depôt twice a day by the halalcure. Before being taken, it is treated with a strong lotion of phenyle and carbolic acid, the seats, &c., are washed twice a day with carbolic acid and carbolic powder is put just near the latrines. The halalcure is strictly supervised by a Municipal Health Inspector.

5. *Water supply*.—Two stand-pipes are provided, the waste water being conveyed to the main drain on the northern side.

6. *Disinfectants*.—A solution of Perchloride of mercury is sprinkled twice daily on the ground floors of the wards and all the floors are linewashed every week. In case of death, the place just under and near the cot is disinfected with phenyle and linewashed after two hours. 5° per cent. solution of Carbolic Acid is used for general purposes such as washing hands, &c., phenyle being freely used, all the floor of the wards are scraped every month and the dirt burnt; new earth being placed, and the floors are linewashed.

Cloths, blankets, sheets, &c., are saturated with 1 per cent. solution of perchloride mercury and exposed to sun till dry, and subsequently washed by the dhobee. Rags, hospital dressings, patient's cloths are destroyed by fire.

7. *Mortuary*.—As soon as a death takes place, the body is removed to the mortuary, which is situated on the east side, after performing religious rites and ceremonies, the body in new clothes is removed to the burial ground.

The expenses (funeral) of the paupers dying are borne out of the hospital funds.

8. *Inoculation*.—None of the patients, contact persons or persons in segregation and health camps were inoculated.

9. *Sickness among the Staff*.—No case of infection or any serious nature amongst the hospital staff or the attendants.

TABLE I.

Months.	Plague.	Relapsing Fever.	Observation cases and General Diseases.	Total.
1898.				
June ... ..	6	} Nil.	3	9
July ... ..	2		.....	2
August ... ..	5		.....	5
September... ..	7		2	9
October ... ..	8		1	9
November... ..	3		1	4
December ... ..	2		1	3
1899.				
January ... ..	5	} Nil.	4	9
February ... ..	9		2	11
March ... ..	8		2	10
April ... ..	2		5	7
May ... ..	7		2	9
Total ...	64		Nil.	23

10. The largest number of admission was on the 12th February and the largest number of cases admitted was during the week ending Saturday 18th February 1899.

11. The total number of deaths during the year were 34. Total number of Plague deaths were 30. The largest number of deaths was 2 on the 14th February 1899.

TABLE II.

	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague ... ..	64	30	34	46·8
Relapsing fever ... ..	.....	.....	.....	.....
Under observation and other diseases ... ..	23	4	19	17·3
Total ...	87	34	53	39·08



TABLE III.

Months.	Total Admission of Plague.	Died within 24 hours.	Died within 48 hours.	Total Deaths.	Total Recoveries.	Percentage of Deaths.
1898.						
June ... ..	6	.....	.....	1	5	16.6
July ... ..	2	1	.....	1	.....	50.0
August ... ..	5	1	1	2	3	40.0
September ... ..	7	1	.....	1	3	14.2
October ... ..	8	4	1	5	6	62.5
November... ..	3	.....	.....	2	2	66.6
December ... ..	2	.....	.....	.....	2	Nil.
1899.						
January ... ..	5	1	.....	2	2	40.0
February ... ..	9	4	2	7	3	77.7
March ... ..	8	2	.....	3	2	37.7
April ... ..	2	1	1	2	2	10.0
May ... ..	7	2	.....	4	4	57.1

TABLE IV.

	Total Admissions.	Deaths.	Recoveries.	Percentage of deaths.
Males ... ..	29	17	12	58.6
Females ... ..	18	8	10	44.4
Children under 12 years ... ..	17	5	12	29.5
Total... ..	64	30	34	

TABLE V.—Mortality showing among sexes and children.

Total Mortality for the Year.	Mortality in Men.	Mortality in Women.	Mortality in Children under 12 Years
30	17	8	5

TABLE VI.—Situation of Buboes.

Situation.	Total No. of Cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of Mortality.
Cervical ... ..	3	1	2	1	2	33.3
Parotid ... ..	.....	.....	.....	.....	.....	.....
R. Axillary ... ..	12	5	7	4	8	33.3
L. Axillary ... ..	15	10	5	11	4	73.3
R. Femoral ... ..	14	7	7	6	8	42.7
L. Femoral ... ..	12	8	4	4	8	33.3
R. Inguinal ... ..	2	2	.....	2	.....	10.0
L. Inguinal ... ..	1	.....	1	.....	1	.....
* Other situations ... ..	1	1	.....	.....	1	.....
No Buboes ... ..	2	1	1	2	.....	10.0
Multiple Buboes ... ..	2	2	.....	.....	2	.....
Total... ..	64	37	27	30	34	

\* Bubo was on the right arm.

There were 3 cases of *Black Plague*, 2 women and 1 man, out of which 1 woman died.

There were two cases of Pneumonic Plague—1 Male child and one woman—both of whom recovered. In one case, a child, there was a bubo, and pneumonia supervened on the third day. Both cases recovered. No Bacteriological examinations were made.

**Fever.** Fever on the onset in mild cases is not above 101·6° F. In severe cases it is between 102° to 105° and in virulent cases it is always above 105°.

**Convalescence.** Three to six weeks.

**Under observation.** There were in all 23 patients under observation and suffering from other diseases out of which 4 proved fatal. 1 Remittent fever, 2 Diarrhoea, and one child with Consumption. The diseases which the cases under observation developed were Bronchitis, Jaundice, Malaria, Remittent fever and Influenza.

**Treatment.** Treatment wholly unsatisfactory. No drug can combat the disease. If the disease is complicated with Diarrhoea, heart failure generally sets in, in spite of all efforts. The following have been found useful for treating symptoms.

**For Fever.** Stimulating diaphoretics such as Liqr. Amon. Acet., Spt. Ether nit, Spt. Vinii Gallici.

For Buboes—Ext. Belladonna and Ext. opü in equal quantities. Counter irritants are contra-indicated as they cause inflammation. Leeches are very harmful.

**Heart.** This is the organ which requires to be sustained, and nothing seems to be more useful than strychnine, Strophanthus with Spt. Amon. aromatic and Brandy. Digitalis is not given as it brings on vomiting.

In convalescence, Quinine and the usual tonic treatment.

Lastly, I respectfully bring to your notice the case of a boy who had suffered thrice at home. He was attacked for the first time in the first epidemic, for the second time in the second epidemic—in both cases before the hospital was opened. He was both the times treated at home. He suffered for the *third time* in the third epidemic, was removed to the hospital and was cured, though immediately before his being removed to hospital his sister died of Plague.

*Remarks by the Special Medical Officer.*

The hospital was one of the most satisfactorily conducted amongst all I had under me. The Committee took a great deal of interest in the way the hospital was conducted, and any suggestion made for the improvement of the hospital met with prompt attention. The hospital itself was situated, where such infectious hospitals ought to be, *viz.*, outside the limits of dwelling houses; they had ample accommodation for their contacts, and the attendants were housed near by the hospital. This community is to be congratulated in their efforts to improve the condition of the suffering poor of their creed. The report of the case of Plague which survived 3 attacks is interesting, and the facts from investigation seem accurate.

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No. 29.

**1. Report on the Hallai (or Meman Wada) Plague Hospital, Bombay, from the month of November 1899 to 31st May 1899.**

2. The building of the hospital is the Jamat Khana of the Hallai Memans, and is situated on Meman Wada Road, in Umakhadi.

It is opened chiefly for the Hallai Jamat by whom the funds are provided. The patients who were admitted were allowed to have a choice of English or Native treatment.

The Hospital was opened during the time of General Gatacre's chairmanship.

Almost all the cases were treated by the Native Hakims. There were 3 ward-boys, 1 bhangi and washerman.

3. The building in question has 2 floors and 1 ground floor. The top floor is for the use of the females, the 1st for males and the ground floor for the dispensary and the staff.

4. The system of conservancy employed and method of disposal of sewage were as usual.

5. Water was derived from the water-pipes.

6. The building was disinfected by phenyle, and carbolic powder was sprinkled on each floor and ward.

7. The dead were disposed of by their friends in the ordinary way, according to Mohamedan customs and rites.

8. There was no sickness and mortality amongst the staff of the hospital.

As the whole arrangement was native, I am unable to give all information required, I therefore beg to be excused.

1st July 1899.

MOHAMED MIA,  
Manager, Meman Wada Hospital.

TABLE I.—Total admissions during the year.

Morths.	Plague.	Relapsing Fever.	Observation cases including all General Diseases.	Total.
29-1-99	1	.....	.....	1
8-2-99	1	.....	.....	1
17-2-99	1	.....	.....	1
11-3-99	1	.....	.....	1
	4	.....	.....	4

1st July 1899.

MOHAMED MIA,  
Manager, Meman Wada Hospital.

TABLE II.

Admission.	Deaths.	Recoveries.	Percentage of Mortality.
Plague ... .. 4	4	.....	... ..
Relapsing Fever ... ..	.....	.....	.....
Observation and other diseases ...	.....	.....	.....

1st July 1899.

MOHAMED MIA,  
Manager, Meman Wada Hospital.



TABLE IV.—*All Mohamedans.*

Total Admission.				Deaths.	Recoveries.	Percentage of Mortality.
Males	...	...	4	4	.....	.....
Females	...	...	...	.....	.....	.....
Children (under 12 years)	...	...	...	.....	.....	.....

MOHAMED MIA,  
Manager, Meman Wada Hospital.

1st July 1899.

Remarks by  
the Special Me-  
dical Officer.

The attendance at this hospital was most unsatisfactory.

No. 30.

### 1. Annual report on the Cutchi Memon Plague Hospital, commencing from December 1898 up to May 31st, 1899.

2. By the combined labour of Haji Yusuf, Haji Sulaiman, and Abdul Wahid, well-known Merchants in the C. M. Community, and also gentlemen of very high positions, this hospital came into existence for the welfare of the plague-stricken patients of their community, and consequently on the 1st of April 1897, while the plague was raging very fiercely in the city, this hospital was declared opened by the name of Cutchi Memon Plague Hospital. The original founders and benefactors of this great sympathetic work were subsequently made joint-secretaries in behalf of their community, and were given powers to receive all donations from the community to meet expenses of the establishment. The above gentlemen made a very liberal donation of Rs. 500 each, and thus set a noble example for the rest of the community to follow, which raised the whole amount by donations to the enormous sum of over Rs. 15,000. But the whole credit is due to the enlightenment and forethought of our learned Secretaries.

A. Our Committee consists of the following members who are all gentlemen of high social position and enlightenment. In all there are 24 members, but for the sake of shortness a few important names are only given here.

1. Haji Abdul Satar (J.P.)
2. Adamji, Haji Mohamed.
3. Haji Maki, Haji Abubakar.
4. Khan Bahadur Haji Abdur Rahman.
5. Haji Jan Mohamed Haji Mohamed Zackria.
6. Haji Hassan Tayab.
7. Haji Ismail, Haji Ishaq.
8. Haji Haji Ibrahim (J.P.)
9. Haji Wahid Danna Haji Kashim.
10. Haji Tor Mohamed Haji Baba.
11. Haji Mahomed Haji Esmail (J.P.)

*B. Medical Officers.*

There being a very small number of patients in the hospital this year, the establishment was kept only to meet the requirements of the time and consisted of as follows :—

- 1 Medical Officer.
- 2 Compounders for night and day duty.
- 4 Ward-boys.
- 2 Ayas.
- 1 Cook.
- 1 Assistant Cook or (Mait).
- 1 Sub-Manager and General Supplier.
- 2 For Miscellaneous Work.
- 1 Sweeper.
- 1 Dhobi.
- 1 Peon.

2. The servants were not admitted into the hospital this year, as was the case last year ; also in cases of the well-to-do, the patients were isolated in a separate room.

3. The hospital building was the *Jamat Khana* which has been very kindly lent by the whole community for the purpose. Therefore, no separate shed or a new building was contemplated. The building itself is very large, airy, and gives a full play of light inside all the wards and surroundings. Indeed, there could not have been a better place than this for the reception of plague-stricken cases. It contains four large wards for the accommodation of male, female, convalescent, and observation cases separately. As many wards are also available downstairs in time of emergency. There is also a separate room for the office and dispensary ; servant's quarters and contact sheds cover one corner of the hospital.

4. *Conservancy*.—Latrines for servants and for the patients have been separated, and great care was taken in the disposal of sewage, which was thoroughly disinfected by disinfecting powder before being thrown away, and all clothes belonging to patients were carefully disinfected by liq. hydrarg. perchlor. before being given to the dhobie for washing. Some of the clothes were burnt and others thoroughly fumigated by sulphur and kept separate for use.

5. Water has been used from the same, and one pipe attached to the building, but no complaint has been known arising from this source.

6. Phenyle was constantly used in the wards and all surroundings in the hospital for disinfection purposes. We also took care to use disinfecting powder round the patient's bed, &c. We did not send any clothes to disinfecting station, as we did not see any necessity for so doing.

7. All the dead in the hospital were disposed of in the ordinary way by their relations and friends. Their beddings and blankets being burnt immediately afterwards.

8. Of all the patients, male or female, admitted in this hospital, none of them were inoculated by Dr. Haffkine's serum.

9. There was no sickness of any nature among the staff of hospital, although we used to mix freely with the plague patients, and without any great precaution or reserve.

10. I send herewith all the tables required, carefully compiled.

11. About the symptoms of the disease on the whole, I can only say that they were *more acute in subjects of plethoric temperament* and mild in weak cases, where as the former patients succumbed in many cases owing to the severity of the symptoms: the latter cases lingered on till recovered. Therefore, it will be not misleading to say that in robust health death was almost certain, while the debilitated state of health always proved a favourable ground and good chance of recovery.

12. *Ice*.—I cannot speak too highly about it. This being so indispensable in reducing the temperature of the patient in a very short time, and bringing unconscious patients to their senses. If there is any specific treatment for bubonic fever I can say very boldly it is the *Ice*, and a system of *mild treatment* and *low diet*.

13. *About the Buboes*.—Most of them have occurred in the groins, very few coming in the axilla.

14. *Period of Convalescence*.—With the exception of two or three cases who were convalescents for fifty or sixty-days, all others were discharged as cured within a month from the date of admission into the hospital.

15. We had only two plague cases complicated with pneumonia, \* both of whom recovered. I have had never a case of mumps mistaken for plague.

16. There was only one case kept under observation.

17. We never tried the curative serum as Roux and Lustig in our hospital.

N. A. MHAR,

Medical Officer in charge.

29th June 1899.

TABLE I.—*Total admission during the year.*

Months.	Plague.	Relapsing fever.	Observation cases including all General Diseases.	Total.	Remarks.
December 1898	...	.....	.....	.. ...	
January 1899	6	.....	.....	6	
February "	6	.....	.....	6	
March "	4	.....	.....	4	
April "	4	.....	.....	4	
May "	4	.....	.....	4	
Total	24	.....	.....	24	

TABLE II.

Diseases.	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.	Remarks.
Plague	24	10	14	41·6	
Total	24	10	14	41·6	

\* The cases were never examined bacteriologically, but were simply diagnosed as such by the physical signs then present.



TABLE III.—*Plague Cases.*

Months.	Total Admission.	Died within 24 Hours.	Died within 48 Hours.	Total Deaths.	Total Recoveries.	Percentage of Death.	Remarks.
December 1898...	.....	.....	.....	.....	.....	.....	
January 1899 ...	6	1	.....	1	5	16·6	
February „ ...	6	3	.....	3	3	50	
March „ ...	4	1	.....	* 2	2	50	* 1 died after 6 days from the date of admission.
April „ ...	4	1	1	2	2	50	
May „ ...	4	1	1	2	2	50	
Total ...	24	7	2	10	14		

TABLE IV.

	Total Admissions.	Deaths.	Recoveries.	Percentage of Death.	Remarks.
Males ... ..	19	9	10	47·3	
Females ... ..	5	1	4	20	
Children (under 12 years)	.....	.....	.....	.....	
Total ...	24	10	14	.....	

TABLE V.—*Table showing the Mortality for the year amongst Sexes and Children.*

Total mortality for the Year.	Mortality amongst the Men.	Mortality amongst the Women.	Mortality amongst Children all under 12 years of age.	Remarks.
10	9	1	...	...

TABLE VI.—*Table showing the Situation of Buboes.*

Situation.	Total No. of Cases.	Males.	Females.	Mortality.	Recovery.	Percentage of Death.	Remarks.
Cervical ... ..	.....	...	.....	.....	.....	.....	
Parotid ... ..	.....	...	.....	.....	.....	.....	
R. Axillary ...	1	1	.....	1	.....	.....	
L. „ ...	1	1	.....	.....	1	.....	
R. Femoral ...	.....	...	.....	.....	.....	.....	
L. „ ...	.....	...	.....	.....	.....	.....	
R. Inguinal ...	13	9	4	4	9	30·6	
L. „ ...	6	5	1	5	1	83·	* R.Poplitia space.
Other situations ...	1°	1	.....	.....	1	.....	
No Buboes ...	.....	...	.....	.....	.....	.....	
Multiple buboes ...	2†	2	.....	.....	2	.....	† On hand and ankle.
Total ...	24	19	5	10	14	.....	

TABLE VII.—*Table showing Pneumonic Plague (without Buboes).*

	Admitted.	Died.	Recovered.	Percentage of death.	Remarks.
Males ... ..	Nil.	Nil.	Nil.	.....	
Females ... ..	„	„	„	.....	
Children ... ..	„	„	„	.....	

TABLE VIII.—*Table showing Cases of Secondary Plague Pneumonia (complicated with Buboes.)*

	Admitted.	Died.	Recovered.	Percentage. of Death.	Remarks.
Males ... ..	2	.....	2	.....	
Females ... ..	.....	.....	.....	.....	
Children ... ..	.....	.....	.....	.....	

No. 31.

**Khatri Mahomedan Hospital, Bapoo Khote Street.**

Report on the working of the Khatri Mahomedan Plague Hospital for the period—1st February to 15th June 1899.

2. History.—The Hospital was founded on the 1st April 1897, by the *Jamat* of the Khatri Mahomedans. It is since then in working order, and is opened during recrudescence each year of the epidemic, and closed temporarily when the disease abates. The following comprises the Hospital Board :—

- (a) Hajee Ebrahim Hoosein, J.P., Chairman.
- (b) Khan Shab Hajee Isak Hajee Isa.
- (c) Hajee Ebrahim Rehimtoola.
- (d) Hajee Oosman Sooleman.
- (e) Mr. Oomar Jaffer, Secretary.

## Hospital Establishment.

- (a) Dr. M. N. Disana, L. M. & S., Honry. Medical Officer.
- (b) One Hospital Assistant (unqualified).
- (c) Two Native Nurses or “ Dhayis.”
- (d) Six Ward-boys.
- (e) One Cook, one Sweeper, one Dhobie.

The Hospital Board in all their deliberations were guided and assisted by Mr. Budrudin Abdulla Kur, J.P., Chairman of the Committee in the District.

*Expenses.*—The expenses in connection with the hospital are defrayed out of *Jamat* funds to which the members of the Hospital Board are large contributors.

3. *Building.*—The hospital building is originally a *Jamat Khana*, i.e., a place or hall whereon religious and other great occasions, the Mahomedans of the Khatri community meet and dine. It comprises a ground floor and three upper floors. The ground floor is utilized for miscellaneous purposes, such as kitchen, disinfecting room, store room, and for accommodation of servants. The first floor is utilized as the observation ward, the second the male ward, and the third the female ward. Each of these wards is capable of accommodating 12 beds, and is well ventilated. No dispensary is attached to the hospital, but all medicaments are supplied by the Hony. Medical Officer from his own Dispensary. Attached to the hospital is a segregation house where contacts are removed, except those who are allowed to stay as nurses by the patient. This segregation house is situated at Nagdevi Street and is in charge of Mr. B. A. Kur, Chairman of the District Committee.

4. *Conservancy.*—Each bed is supplied with a bed-pan, and the sweeper who is constantly present on the premises, removes the excreta at once and disposes of them under directions of the Municipal Health Inspector. Servants and contacts are supplied with chamber pots placed on the ground floor. In 1897, when I applied to General Gatacre’s Committee for the construction of suitable closets, the above was the arrangement recommended for adoption after inspection of the building by the Committee,

5. *Water Supply*—On the ground floor is a large pipe in charge of the cook. Underneath is a tank from which the hospital is supplied with water. There are taps on each floor, but they were not utilized.

6. *Disinfection*—The wards are treated every evening with strong phenyle solution, and the walls and flooring are lime-washed once every month. When the hospital closes temporarily, the District Plague Officer gets the whole building disinfected.

The linen and clothing are never sent to the Disinfecting Station but disinfected in the hospital premises. All linen, bedding and clothing, soiled by excreta, are destroyed by burning. The rest is dipped in a solution of perchloride of mercurry 1 in 2,000 for twenty-four hours and then washed thoroughly by the dhobie on the premises.

7. *Disposal of the Dead*—The front verandah of the ground floor is utilized as a mortuary. A patient dying in the ward is brought down here, dressed and placed in the coffin, and taken immediately to the cemetery by contacts, and part of the hospital establishment. Very little or no time is lost as the Mahomedan religious rites enjoin early interment. The verandah is then treated with perchloride solution and lime-washed. There is no difficulty as regards pauper patients who receive the same attention when dead as the rich ones.

8. *Inoculation*.—None of the patients treated in this hospital were inoculated with Haffkine's or any other serum. The Mahomedans in this district have never taken a favourable view of it.

9. No sickness of any consequence occurred among the Hospital staff or the contacts who attended as nurses.

M. N. DISANA,

HON. MEDICAL OFFICER,  
KHATRI MAHOMEDAN PLAGUE HOSPITAL,  
AND KOLSA MOHLLA M. PLAGUE HOSPITAL.

TABLE NO. I.—*Total Admissions during the year.*

Months.	Plague.	Relapsing Fever.	Observation Cases including all General Diseases.	Total.
1899.				
February from 15th ...	1	.....	.....	1
March ... ..	12	.....	.....	12
April ... ..	3	.....	1	4
May ... ..	.....	.....	.....	.....
June up to 15th ...	.....	.....	.....	.. ..

The largest number were admitted on the 6th March 1899, when 3 were admitted.



TABLE NO. II.

	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague ... ..	16	9	7	56.2
Relapsing Fever ... ..	.....	.....	.....	.....
Observation and other Diseases	1	.....	1	.....
Total ...	17	9	8	52.9

TABLE NO. III.

Months.	Total Admissions.	Died within 24 Hours.	Within 48 Hours.	Total Deaths.	Total Recoveries.	Percentage of Deaths.
February from 15th... ..	1	.....	.....	.....	1	.....
March ... ..	12	1	1	8	4	66.6
April... ..	4	1	.....	1	3	25.00
May ... ..	.....	.....	.....	.....	.....	.....
June up to 15th ... ..	.....	.....	.....	.....	.....	.....

Remarks—There were no cases of Relapsing Fever.

TABLE NO. IV.

	Total Admissions.	Deaths.	Recoveries.	Percentage of Deaths.
Males ... ..	10	7	3	70.0
Females ... ..	6	2	4	33.3
Children (under 12 years) ...	1	.....	1	.....

TABLE NO. V.—Table showing Mortality for the year amongst Sexes and Children.

Total Mortality for the Year.	Mortality amongst the Men.	Mortality amongst Women.	Mortality amongst Children all under 12 Years of Age.
9	7	2	Nil.

TABLE NO. VI.—Table showing the Situation of Buboes.

Situations.	Total No. of Cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of Mortality.
Cervical ... ..	.....	.....	.....	.....	.....	.....
R. Parotid ... ..	.....	.....	.....	.....	.....	.....
R. Axillary ... ..	1	1	.....	1	.....	100
L. Axillary ... ..	5	1	4	2	3	40
R. Femoral ... ..	.....	.....	.....	.....	.....	.....
L. Femoral ... ..	3	2	1	1	2	33.3
R. Inguinal ... ..	5	4	1	3	2	60
L. Inguinal ... ..	1	1	.....	1	.....	100
Other Situations ... ..	.....	.....	.....	.....	.....	.....
No. Buboes ... ..	.....	.....	.....	.....	.....	.....
Multiple Buboes ... ..	1*	1	.....	1	.....	100

\* Left Cervical. Left Femoral, Left Thigh. Left Ankle. Left Cervical, Right Cervical,

TABLE NO. VII.—Table showing *Pneumonic Plague (without Buboes)*.

				Admitted.	Died.	Recovered.	Percentage of mortality.
Males	...	...	...	.....	.....	.....	.....
Females	...	...	...	1	1	.....	100
Children	...	...	...	.....	.....	.....	.....

TABLE NO. VIII.

*Table showing Cases of Secondary Plague Pneumonia (complicated with Buboes).*

				Admitted.	Died.	Recovered.	Percentage of mortality.
Males	...	...	{ None admitted with 2nd Pneumonia but all the 3 developed it in the hospital. }	2 1 .....	..... ..... .....	..... ..... .....	100 100 .....
Females	...	...					
Children	...	...					

**Notes on the Symptoms, Character and Treatment of the Disease.** (From experience obtained in this and other Hospitals in my charge, as well as private practice).

*Incubation.*—The period of incubation varies from a few hours to a few weeks. No approximate time could be fixed ; all depends on the vitality of the tissues of a person to resist the poison. Amongst the ricketty and those whose staple food is “ dhal ” and rice alone, such as among the Jains and among the lower order of almost all communities, the resisting power of the tissue is so low, that the period of incubation is very short. On the other hand, among the robust and among the higher orders of all classes who indulge in a mixed food, including vegetables, fruits, &c., the resisting power of tissues to the plague germs is long.

*Cases.*—Ismail Hajee Moti, a wood merchant, was living for 2 months in the forest of Atgaon, about 40 miles away from Bombay. His younger brother in Bombay having been attacked by Plague, Ismail was telegraphed for. He arrived in Bombay at 8 p.m. on the 9th February 1898. At 9-30 p.m. he had severe rigor, and I was sent for to see him. His temperature was found  $104^{\circ}$  at 7 a. m., the next morning I again saw him, and found that he had a large bubo in the left Axilla. He was at once removed to the Kolsa Mohola Hospital, and died four days after. Here the incubation period was not even two hours.

Cassum Mahomed, aged 30, was nursing his mother who was laid up with Plague on the 15th February 1899. Cassum himself was attacked on the 13th March 1899, and sent to the hospital lying by the side of his mother. During the intervening period. Cassum, who was usually of a cheerful temper, looked very ill. He complained of feverish condition at night and occasional vomiting. This is a case in which the incubation period has been nearly a month.

*Symptoms.*—The symptoms at the onset of the disease vary so very much that for clinical purposes, I divide the disease into the following groups.

- |  |   |
|--|---|
| I. Plague Simple with or without Bubo.     | $\left\{ \begin{array}{l} (a) \text{ Mild cases.} \\ (b) \text{ Ordinary cases.} \\ (c) \text{ Severe cases.} \\ (d) \text{ Virulent cases.} \end{array} \right.$ |
| II. Pneumonic Plague with or without Bubo. | $\left\{ \begin{array}{l} (a) \text{ Primary pneumonia.} \\ (b) \text{ Secondary pneumonia.} \end{array} \right.$   |
| III. Septicæmic Plague.                    | $\left\{ \begin{array}{l} (a) \text{ Simple Septicæmic.} \\ (b) \text{ Septicæmia with one or many blisters, or blebs.} \end{array} \right.$                      |

Class I.—Plague Simple (a) mild cases.

In this form the patient goes generally to private medical dispensaries complaining of slight glandular pain, and gives one to understand that he consults only as a precautionary measure. On examination a lymphatic is found, enlarged and painful on pressure. His pulse is quick, about 130, and temperature ranging from 99 to 100°. His looks are frightened, excepting this no other symptom is visible. These cases are met with just about the time when recrudescence commences, and easily yield to judicious treatment locally and internally in about 24 to 48 hours. If treatment is then discontinued on or about the third day there is a relapse with severe symptoms. These cases are rarely seen in hospitals.

*Class 1 (b)—Ordinary Cases*—In this, the patient complains of feverish condition and slight glandular pain. He too generally attends the dispensary of medical men. On examination he is found to have fever about 100°. He has furred tongue, anxious looks, slight headache, loss of appetite, and pains in the limbs. His friends are warned of the danger, but neither he nor they attach any weight to the warning. He moves about in the house and often in the streets, even doing some business, when suddenly, on or about the fourth day, he feels nausea and choking sensations in the chest. He vomits copiously yellow or greenish-yellow matter, and simultaneously shivers and is feverish. On examination the gland seems to have increased in size and is most painful. The temperature immediately after vomiting is about 102°, and within a few hours reaches up to 104°. The pulse which is soft and compressible after vomiting becomes full, bounding, and running with the rise in temperature. The skin which is cold and moist during the shivering stage, becomes hot and dry within a few hours. The feeling of nausea persists, and there is heaviness about the head. The patient is excited, the features get flushed, and he tries to sleep. This is the onset in ordinary cases.

*Case.*—Amnabai Mahomed Oomer, age 21, was on the 18th March 1899, brought to the Khatri Mahomedan Hospital suffering from Plague. On admission her temperature was found to be 104°, pulse very soft and compressible, strong feeling of nausea, face pale, covered with moist perspiration, restlessly tossing in bed. She vomitted soon after, and then lay prostrate in bed. She did not like to be disturbed, speech suddenly became blurred, face flushed, pulse bounding, but very rapid, 140, temperature stood to 104°. The history given by the friend was that she had been ailing for the past four days and had pains in the left axilla. She continued to do household work (for fear of being taken to the hospital) without informing any one; on the fourth day she felt her lower limbs as it were paralysed; on getting up from bed, she felt intense headache, and then only she told the people in her house. She was brought to the hospital on the 18th, and became convalescent on the 30th.



*Class I.—C. Severe Cases.* In this form there are no preliminary symptoms before the regular onset. They are all ushered in at once. The patient is either walking, sitting, or at work, and suddenly he feels giddy, with nausea, dimness of vision, weight in the chest; a few minutes after, he vomits copiously yellow matter and this is accompanied by a severe rigor. He soon points to some spot in the groin, axilla, &c., where he feels cutting pain. He or his friends press the part and find a gland. He now knows what has come on. He lies in a dejected state and passes to semi-unconsciousness, speech becoming blurred. On examination his temperature is found to be about  $104^{\circ}$ . His skin is dry and pale. He breathes hurriedly, pulse is between 120 and 140, rapid, small, and irregular. He complains of severe headache, nausea, and aching pain in the limbs. He goes to micturate, but cannot pass urine. A few hours later the temperature rises by a degree or two. The conjunctivæ are injected: he tries to sleep, but cannot, and says that on shutting eyes he finds all sorts of beasts, &c., running before his sight. This last is a prominent symptom, particularly among young boys. Next morning, he gets up a little better and composed, and complains of insomnia, either constipation or diarrhoea but generally the former. The case then progresses.

*Case.*—Isa Sooleman, age 45, was attacked with plague, on the 28th February, and brought to the Hospital on the 2nd March. *History.*—He was carpenter by profession and, whilst working, suddenly fell down; he felt choking sensations in the chest and vomited soon after. He then had fever, and remained at home for 2 days under the care of his wife. On the 2nd March, when she too was attacked, both were brought down to the hospital. On admission Isa's temperature was found to be  $104^{\circ}8$ —pulse 140, rapid, full and bounding, but the heart sounds were very weak. There was already bronchitis which he had for a very long time. He lapsed occasionally to a state of semi-unconsciousness, but could be roused and made to take medicine and nourishment and would answer questions composedly. On examination a large gland was detected in the right axilla. His heart began to fail, and continued to do so till he died on the 5th March 1899.

*Class I.—(d) Virulent cases.*—In this the onset is very sudden, the patient is suddenly struck down unconscious, followed within a few minutes by fits of convulsions and often death. In many cases, consciousness is regained and the patient feels drowsy. He finds that his speech is paralysed; on examination his temperature is found to stand above  $105^{\circ}$  pulse is quick and thready. He points to a place where he feels pain most, and this on examination is found to contain a gland. Fits of convulsion often recur. In this state he lives from a few hours to two or three days.

*Case.*—Mohomedally Adamjee Charter, age 35. After his evening meal, he was sitting in the verandah of his house at about 7 p. m. He suddenly fell down and was seized with a fit of convulsions. He was carried in, and a doctor was sent for. He declared the case to be one of hemiplegia. At 8-30 p. m. I saw him. His temperature was  $105^{\circ}$ . Pulse weak and thready, looks peculiarly frowning, heart sounds weak, retention of urine. He had hemiplegia of the left side. A friend of his called my attention to his left groin, which on examination was found to contain a large bubo. I pressed it and, though drowsy, he shouted and made distorted features. I informed his people of the nature of his disease, but they opposed the idea of his having plague, on the ground that another medical gentleman had called it a case of paralysis. I waited till the next morning only to learn that he had died at 10 p. m.

*Class II.—(a). Primary Pneumonia.*—In most cases the onset is sudden and fever, bubo and pneumonia all three occur simultaneously. In my observation I have found that in most pneumonic cases the respiratory system was not healthy before. There had been Catarrh or Bronchitis or Emphysema or Tuberculosis, or the patient was a drunkard, a hard smoker, a pan and tobacco chewer or an opium-eater. At the onset pneumonia is found in its first stage, *viz.*, that of congestion. The next stage, *viz.*, that of engorgement sets in within a few hours, and should the patient live, exudation commences within 12 hours. The stages follow one after the other in very rapid succession. The symptoms at the onset are the same as described above under heading (c) severe cases, and (d) virulent cases, with the addition of symptoms of ordinary croupous pneumonia. If the latter be lobular, *i.e.*, a few dull patches are discovered, the prognosis is often favourable, but should the whole lung be infected, the chances of recovery are few. The fatal sign is when streaks of blood appear in the sputum. When this appears the chances to recovery are few. Besides pain, dyspnoea, high temperature, the one noticeable symptom is difficulty at deglutition. The patient, after vain attempts to swallow food or medicine, spits about him, sometimes right in to the face of the persons standing by as if he did it purposely, such is the onset of Primary Plague Pneumonia.

*Case.*—Omer Usman aged 15, was admitted to the Khatri Mahomedan Hospital, on the 6th March. On admission his temperature was 104.2, pulse 130, rapid, running, skin dry, tongue furred, conjunctivæ injected, complained of severe headache.

*Examination.*—A large inguinal gland. Rales and crepitations in both the lungs, chest hyper-resonant, breathing hurried. Next day fever went down to 99 in the morning and again rose to 104 in the evening. Body was cold. Skin moist and dullness all over the chest. He felt very comfortable till 2 p.m., when the rise commenced, and then he passed to a drowsy condition from which he never recovered. On the 7th he was very uneasy, tossed about in bed, speech became blurred, and streaks of blood appeared in the sputa. He refused nourishment as well as medicine, and when pressed to take it would spit it out. On the 8th, cold perspiration set in, respiration became embarrassed, heart began to fail and he died.

*Class II.—Pneumonic Plague (b) Secondary.*—This I consider to be merely a symptom of the failing heart, rather than a complication. In most cases a bruit manifests itself with the first sound of the heart. I consider it to be a mere acute mechanical congestion of lungs through weakness of the heart.

*Class III.—Septicæmic Plague (a) Simple Septicæmia without Bles.* In this variety the symptoms at the onset are the same as described above in Class I (b) and (c), ordinary and severe plague cases, but the buboes are characteristic in appearance. More than one, as many as four, five or six, may appear at once, or there may be none at the onset; then after a time one may appear, and just when convalescence is expected, another one is seen; then a third, and so on—one almost every week. After two or three have appeared, further development may get arrested, or they may continue to develop until the patient dies of exhaustion.

*Case.*—Hajee Vulee, living at Kolsa Moholla, was attacked last year by a series of five glands in the neck, which included two cervical, two maxillary and one parotid, forming a swollen mass below the face, as big as the face itself. Two more were in the axillæ and two in both the groins. The boy died on the fourth day.



*Multiple Buboes.*

*Case II.*—Cassum Mahomed, a coffee-shop keeper, was admitted in the Khatri Mahomedan Hospital, on the 13th March 1899, with a gland in the left cervical region. This disappeared on the third day after admission, the temperature going down about the same time. On the 18th a large-sized gland was found in the left femoral region. On the 22nd two were found simultaneously—one on the left tibia and one on the upper surface of the left great toe. Simultaneously blebs appeared in close proximity of the glands. On the 28th a large mass was seen in the right cervical region, and on the 30th he died. I had one case last year with nine glands, and the last part to be attacked, about six weeks after, was the liver which suppurated, and the patient died.

*Class III.*—*Septicæmic Buboes with Blebs.*—In this the symptoms at onset are the same as in the above variety, but with the addition of blisters or blebs either above the gland or in close proximity of it. They vary in size and shape and colour. There may be a dark congested spot with or without a bleb in the centre. If the congested spot, having the appearance of ecchymosis, is left to itself, a bleb forms over it a few hours afterwards. The fluid in the bleb is viscid, yellowish, and the patient not only complains severe burning pain in this part but in the whole body. The local burning ceases after the bleb is opened and a few poultices applied.

*Fever.*

I regret, without the assistance of qualified Hospital Assistants or Nurses, temperature charts could not be kept in most cases; but the temperatures were mostly noted by me in the papers of cases relating to patients.

*Remarks.*—In most cases the regular onset begins with the temperature of  $102^{\circ}$ . After vomiting it shoots up to  $103^{\circ}$ ,  $104^{\circ}$ , up to  $107^{\circ}$ , and rarely to  $108^{\circ}$ . Next morning the temperature either falls to  $99^{\circ}$  or below with an evening rise to about  $104^{\circ}$ , or it falls to about  $102^{\circ}$  or  $103^{\circ}$  in the morning, and rises again by 1 or 2 degrees in the evening. Should the temperature have fallen down to  $99^{\circ}$  in the morning with some rise in the evening, it is generally a fatal indication, no matter how cheerful the patient and his friends look. A temperature of above  $105^{\circ}$  at the very onset is again generally a fatal symptom.

*Buboes.*

These are of two varieties—(1) simple; (2) with blisters or blebs.

In 1897 the second variety almost did not exist.

In 1898 they appeared just about the time when the virulence of the epidemic was most severe, and this year they were seen from the very beginning of the recrudescence, leading me to suppose that the virulence of the epidemic would be more severe this year than during the former ones. Buboes vary in size from a grain-seed to a large pear, their shape being rounded or elliptical; and when two or more unite together, as the cervical and the sub-maxillary, they form an irregularly shaped mass.

*Situation.*—From observations I have come to the conclusion that in most cases buboes appear about the situation of those glands which at one time or the other have become diseased. Native children generally suffer from otorrhœa, stomatitis, aphthæ or skin diseases of the scalp, &c.; and among them buboes appear in the cervical, parotid and sub-maxillary region mostly. Among females who have generally had sore nipples, mammary abscesses or scrofulous enlargements of the axillary or cervical glands, the favourite situation of buboes is the axilla or cervical



region ; and so among men who have at one time or the other had venereal or specific diseases, the common situations are the inguinal and femoral regions. The following is the order then in which buboes generally occur :—

Among Males—

Inguinal.  
Femoral.  
Axillary.  
Multiple.

Among Females—

Axillary.  
Cervical.  
Femoral.  
Inguinal.

Among Children—

Cervical.  
Parotid.  
Sub-Maxillary.  
Femoral.

Besides these, the rare situations, I noticed, are on the tibia, the outer side of the chest about 2 inches below the axilla, the pubes, the great toes, the scrotal sac, and one on the palpebral muscle of the right eye at the situation of the supratrochlear gland. When buboes are in such unusual situations, the prognosis is most favourable ; the most fatal situation is a bubo in the left axilla, and the most fatal form is the one with blebs. In the case of the former the heart from the very onset is so very much oppressed that fatal termination is often very sudden.

Buboes mostly appear simultaneously with fever and other symptoms at the onset, but in some cases they either precede fever by a few hours to few days, or they appear after it. Sometimes patients undergo treatment for fever, lassitude, &c., at private dispensaries for about a week, and then a bubo is discovered.

*Development.*—At the onset they are very small, but continue to grow in size, the inflammation extending, until about the fifth day. They then suppurate about the fifteenth to twenty-fourth day. In the event of an irritant being applied over them, such as Indian marking nuts or some preparation of arsenic, they soon get inflamed to an enormous size, often spreading fatal inflammation to other parts. The peculiarity about suppuration is that, as soon as a slight fluctuation is noticed, the whole gland gets softened, and bursts open within a day or so. When irritants are applied, the soft tissues above often get destroyed, and one sees a white mass protruding from the surrounding redness.

*Complications.*

Hæmoptysis, particularly in pneumonia ; aphonia ; difficult deglutition ; pneumonia, primary or secondary ; endocarditis ; marked bruit with the first sound ; œdæma of the legs ; diarrhœa, (a fatal symptom,) constipation a favourable symptom ; tympanitic abdomen, a fatal symptom ; retention of urine ; hemiplegia ; insomnia ; unbearable headache ; deafness, noticeable mostly in primary pneumonic cases ; muscular tremor ; hæmorrhage from the ear, mouth and rectum. Some of these, such as headache, constipation, tremor, should be classed more as symptoms of high fever than as complications.

*Sequelae.*

I have just now under treatment a case of heart-disease in a patient, by name Dewukram, treated for plague by me last year at the Vussonji Tricumji Hospital for Baniyas at Mandvie; another of œdæma of the right leg, where a gland existed last year. Stiff joints, such as the elbow, the shoulder and the hip-joint, are often come across where a plague gland in former years existed. Phthisis is also met with, and general debility or breakdown of the constitution is invariably met with, even if a patient has been discharged from the hospital considerably increased in weight.

*Period of Convalescence.*

This varies according to the form and variety of plague. In mild and ordinary cases it may be roughly taken to a week, and in severe cases a month or even more.

*Plague complicated with other Diseases.*

Heart-disease and other complications are mentioned above, but plague is confounded with mumps, traumatic glands and enlarged lymphatics, due to skin diseases. As regards mumps, the question is, why this disease should appear in large numbers just about the time when the plague commences to abate. Why it is more frequent among children, and whether it should not be taken as a mild form of plague.

A peculiarity in symptoms at onset among plague-stricken children under three years of age, as well as among pregnant women, is that they begin invariably with convulsions, and the latter almost generally abort on the third day.

*Treatment.*

The treatment of patients varies according to the form of plague with which they are attacked and their constitution. No hard and fast rule can be laid down in this respect. Two patients from the same house may have been attacked with the same symptoms and the same form of the disease, and yet their general condition may require different treatment. As regards drugs nothing has succeeded to eliminate the poison and hasten recovery. A drug which may agree in one case may prove positively harmful in another. The treatment, therefore, is general, and more of a stimulating and supporting nature than poison eliminating.

*Mild Cases.*—These generally recover by a judicious dose of purgatives and followed by moderate doses of Quinine, continued for about a week. Calomel seems to suit most, but requires to be watched, lest it should set up fatal diarrhœa. This treatment to a certain extent succeeds in ordinary cases also, but in severe and other forms the main object for the first four days should be to *support the heart*. In most cases it is this organ which fails, even in primary pneumonia, and in secondary. I am inclined to believe that the pneumonic symptoms are due rather to sudden enfeeblement of the heart owing to a large quantity of poison having been poured into its substance than to any lesion in the lung itself.

*Symptomatic Treatment.*—For the bubo I have found leeches succeed well in mild cases, but prove fatal in severe ones. In the latter the following has succeeded well in lessening pain, as well as in bringing about uninterrupted, speedy suppuration :—

Ext. Belladonna.	} a. a 3 I.
Ext. Opii.	
Ext. Cannabis Ind.	
Red Lead (Plumbi Oxidum).	} a. a 3 zgs.
Hydrarg Oxidi Rubri.	
M. ft Pasta.	



The bubo to be fomented a little with hot water, and the paste to be applied thickly, a piece of lint to be placed over it, and, over the whole, hot linseed-meal poultices to promote rapid absorption. Generally within six to twelve hours the pain ceases excepting on movement, and this is really a point achieved, since it lessens the patient's discomfort. As soon as the pain ceases, the poultices are discontinued, and the paste allowed to dry over the bubo. Suppuration commences without disturbing the external skin, and even without the knowledge of the patient about the tenth day. In those cases where the heart shows symptoms of failure from the very beginning, the quantity of opium is lessened and sometimes omitted.

*Fever.*—For this symptom it is easy to say what drugs are harmful rather than what are useful. All antipyretics are contra-indicated, excepting quinine in very small doses, the most fatal being aconite, antipyrin, antifebrin, phœnacetin and salicylic acid; so also depressent diaphoretics. The only useful medicine for this symptom is alcohol in moderate doses given at stated intervals. Good brandy, diluted well, proves the best diaphoretic, the best expectorant, the best diuretic, and the best soporific in this disease. Of late I have given extensively a much neglected Compound, *viz.*, Tincture of Warburg. It proves a good stimulating diaphoretic, and having seen lately a copy of the original receipt, the idea that it contained any harmful drug, such as aconite or Iodine, is dispelled. This compound contains aloes which relieves constipation, and eliminates poison. It requires to be given in moderate doses, lest the aloes may set up diarrhœa. During the onset internal remedies are not tolerated, and we have to depend on external ones—ice to the head, cold douche, sponging the body with evaporating lotion, (and for this too brandy and water serves best), wet packing of the abdomen and back.

*Headache.*—Nothing affords so much relief as the ice bag. Shampooing or massage of the scalp also affords great comfort.

*Insomnia.*—All drugs having a depressing influence on the heart are contra-indicated. If there be no delirium, *tinc. cannabis ind.* answers best.

*Delirium.*—Excepting ice bag, everything else is harmful.

To support the heart, moderate doses of stimulants, in combination with strychnia, caffeine and strophanthus, are the best. All other heart tonics, such as digitalis, convallaria majalis, iron, &c., are contra-indicated.

Nausea and vomiting are checked by a little vinegar and water sweetened with honey. Gastric sedatives, such as hydrocyanic acid and bismuth, are contra-indicated. For pneumonia nothing is better than supporting treatment. Alcohol, in combination with caffeine, nux-vomica, and carbonate of ammonia, suits well. External irritants, such as different liniments, only serve to make the patient more uncomfortable. Dry fomentation answers best. For septicæmia, if there is no complication of the lungs or the kidneys, mercury and iodine answer best.

For diarrhœa, vegetable astringents, such as tannic or gallic acid, are useful. Opium and its preparations are contra-indicated. Bismuth and salol are sometimes good, but they produce flatus.

I have given full trial to the Khoja Hospital decoction, containing several native herbs, and find that it is as useful as any ordinary diaphoretic mixture in curing the disease. Mild and ordinary cases which yield to any treatments are benefited by this decoction also, but it is found to be worse than useless in severe and other cases, for it paralyses the heart, as much as Digitalis does, and the resins contained in it sets up fatal diarrhœa. The reason why it succeeds so well in the Khoja Hospital is to be



looked to, not in the decoction, but elsewhere; perhaps previous inoculation has something to do with it or the early resorting of the people to the hospital for treatment. Given by the same medical gentleman elsewhere than the Khoja Hospital it proved useless. I would prefer Tincture Warburg to it.

M. N. DISANA,

Hony. Medical Officer, Khatri Mahomedan

Plague Hospital and Kolsa Moholla

Mahommedan Plague Hospital.

*Notes by the Special Medical Officer.*

I have given Dr. Disana's report in full, as he has had a long experience of this disease, and his notes are worth perusal.

I am disappointed on the small number of admissions in this hospital.

### Kolsa Moholla Hospital No. 32.

*Report on the working of the Kolsa Moholla Mahommedan Plague Hospital  
for the period 1st January to 15th June 1899.*

*History.*—This was the first hospital started in Bombay in the very locality of the people for whom it was intended, in April 1897. It is located, like other Mahommedan hospitals, in the *Jamat Khana* or dining hall. The following comprises the Hospital Board :—

- (a) Khan Shab Hajee Ebrahim Hajee Soomar Patel, *Chairman*.
- (b) Sirdar Khan Bahadur Cassum Hajee Mitha, J. P.
- (c) Hajee Ebrahim Hajee Ahmed Patel.
- (d) Mr. Alli Mahomed Abba Joorna, J. P.
- (e) Hajee Oosman Hajee Abba, *Secretary*.

#### *Hospital Establishment.*

- (a) Dr. M. N. Disana, L.M.& S., Honorary Medical Officer.
- (b) One Hospital Assistant.
- (c) Four Ward-boys.
- (d) One Cook, one Sweeper, one Dhobie.

*Expenses.*—The expenses incidental to the working of the hospital are incurred out of the *Jamat* Fund, collected by a sort of income tax. No donations have been received from any one, and the Honorary Medical Officer, besides giving his services free of charge, supplies medicaments free.

*Building.*—It is a three-storied building, open only to the West, and has three stories with a ground-floor. The last is utilized as a store and cook room, and has accommodation for servants and contacts. The first storey is utilized as an Observation Ward; the second, the male; and the third, the female. No segregation house is provided. The building had had no conservancy arrangement before. General Gatacre's Committee undertook the construction of water-closets, and erected water-pipes. The expenses amounted to about Rs. 1,800, half of which were paid out of the *Jamat* Funds and the other half by the Municipality. There are flushing tanks connected with the latrines.

**Conservancy.**

*Water-supply.*—It is drawn out of pipes erected on each floor by the Plague Committee in April 1897.

*Disinfection.*—Whenever there are patients, the wards are treated with phenyle solution, and the flooring washed with lime once a fortnight. This year the linen and clothing, as well as bedding, soiled by patients have been all destroyed. The rest were treated with strong phenyle solution and washed by the Dhobie.

*Disposal of the Dead.*—On a patient dying, he or she was taken to the back of the ward, and there dressed and put into the coffin and taken to the Burial Ground.

*Inoculation.*—Of the patients admitted none were inoculated.

No sickness occurred among the hospital staff.

*General Remarks.*—This year only seven patients were admitted into the hospital, out of which three died, and four were discharged cured. One of the reasons for the small number of admissions is the retirement of Sirdar Khan Bahadur Cassum Hajee Mitha from active search-work through ill-health ; but the more notorious one is apparently the dislike of hospitals by the Mahommedans in general in this part, no matter whether it be their own *Jamat* hospital where friends could attend, and privacy was respected, or Municipal hospitals ; and, consequently, comparing their general death-rate, I am inclined to believe plague cases were successfully concealed. I append herewith the necessary tables called forth in the circular.

As to remarks on clinical experiences, I have included them in my report on the working of the Khatri Mahommedan Hospital, Bapu Khote Street.

M. N. DISANA,

Hony. Medical Officer, Kolsa Moholla  
Mahommedan Plague Hospital and  
Khatri Mahommedan Hospital.

*Notes by the Special Medical Officer.*

The work done by this hospital was very small and unsatisfactory, especially as the hospital is situated in a very crowded locality, and ought to have been used extensively.

TABLE NO. I.—*Total Admissions during the year.*

Months.	Plague.	Relapsing Fever.	Observation Cases, including all General Diseases.	Total.
January 1899     ...     ...	1	.....	.....	1
February     ,,     ...     ...	4	.....	.....	4
March     ,,     ...     ...	2	.....	.....	2
April     ,,     ...     ...	.....	.....	.....	.....
May     ,,     ...     ...	.....	.....	.....	.....
June     ,,     ...     ...	.....	.....	.....	.....

TABLE No. II.

	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague ... ..	7	3	4	42·8
Relapsing Fever ... ..	.....	.....	.....	.....
Observation and other Diseases.	.....	.....	.....	.....
Total ...	7	3	4	42·8

TABLE No. III.

Months.	Total Admissions.	Died within 24 Hours.	Died within 48 Hours.	Total Deaths.	Total Recoveries.	Percentage of Deaths.
1899.						
January ...	1	.....	.....	1	.....	100
February ...	4	1	.....	2	2	50
March ...	2	.....	.....	.....	2	.....
April ...	.....	.....	.....	.....	.....	.....
May ...	.....	.....	.....	.....	.....	.....
June ...	.....	.....	.....	.....	.....	.....

TABLE No. IV.

	Total Admissions.	Deaths.	Recoveries.	Percentage of Deaths.
Males ... ..	3	1	2	33·3
Females .. ...	4	2	2	50
Children (under 12 years)	.....	.....	.....	.....

TABLE No. V.—Table showing the Mortality for the Year amongst Sexes and Children.

Total Mortality for the Year.	Mortality amongst Men.	Mortality amongst Women.	Mortality amongst Children (all under 13 years of age).
3	1	2	.....

TABLE No. VI.—Table showing the Situation of Buboes.

Situation.	Total No. of Cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of Mortality.
Cervical ... ..	1	1	.....	.....	1	.....
R. Parotid ... ..	.....	.....	.....	.....	.....	.....
R. Axillary ... ..	1	.....	1	.....	1	.....
L. Axillary ... ..	1	.....	1	1	.....	100
R. Femoral ... ..	2	1	1	.....	2	.....
L. Femoral ... ..	.....	.....	.....	.....	.....	.....
R. Inguinal ... ..	1	.....	1	1	.....	100
L. Inguinal ... ..	.....	.....	.....	.....	.....	.....
Other Situations ... ..	.....	.....	.....	.....	.....	.....
No Buboes ... ..	1	.....	1	1	.....	100
Multiple Buboes ... ..	.....	.....	.....	.....	.....	.....



TABLE No. VII.—*Table showing Pneumonic Plague (without Buboes).*

				Admitted.	Died.	Recovered.	Percentage of Mortality.
Males	...	...	...	.....	.....	.....	.....
Females	...	...	...	..... 1	..... 1	.....	100
Children	...	...	...	.....	.....	.....	.....

TABLE No. VIII.

*Table showing Cases of Secondary Plague Pneumonia (complicated with Buboes).*

				Admitted.	Died.	Recovered.	Percentage of Mortality.
Males	...	...	...	.....	.....	.....	.....
Females	...	...	...	.....	.....	.....	.....
Children	...	...	...	.....	.....	.....	.....

No. 33.

**Petit Mills Hospital.**

*Report on the Maneckji Petit Mills Hospital, Bombay, from March 1898 to May 1899.*

1. Owing to the plague and house-to-house visitation of the authorities, the mill hands became nervous, and resolved to bolt away in numbers to their native place. In time a good many left, and the mill business was hampered.

So the agents of the mills, through the manager, consoled the mill-hands, and promised to erect a temporary plague hospital, where they would be looked after, instead of being sent away to the Municipal hospitals if they be attacked with plague.

They heartily approved of this, and abandoned the idea of "going away." The hospital was opened on 1st March 1898. I was appointed to look after it with one Hospital Assistant, Mr. J. A. DeSouza, one compounder (Balvant Sakaram Barve), one ward-boy (Sakaram Bapoo), with other servants.

All the expenses of the Petit Mills Hospital were defrayed by the mills solely. I should like to note that the mill has got a dispensary of its own for the workmen (which are nearly five thousand) for the last fifteen years.

2. The hospital was erected on a large plot of ground, in the compound of the mills.

The hospital was a temporary one, so it was made of matting and cadjan leaves. We have submitted a plan for permanent hospital to the Municipality on good sanitary principles, with arrangements for ventilation at bottom and top (just as the Maratha Hospital).

The temporary hospital was made in two blocks of three rooms each, with accommodation for six patients.

The mill dispensary was also in the same compound, close by.

One contact camp, with accommodation for about forty people, was erected along with the hospital.

Servants' quarters were a little away from it.

3. A Bhungy was kept night and day to take away the ejecta, and keep the place clean. Earthen chatties were freely supplied for the same.

Two water-closets were erected.

All the clothing, bedding, &c., of the plague cases were burnt up, if the case terminated in death. Clothing, &c., of the recovering cases were disinfected by dipping them in perchloride of mercury lotion.

4. Water-supply was from the Municipal taps, separate for the purpose.

5. Disinfection of wards and surroundings was done by digging up the ground and freely sprinkling chloride of lime and perchloride of mercury lotion.

6. According to the mill agent's instructions through the manager, the feelings and the caste prejudices of the mill-hands were much to be respected, and the dead were immediately carried away by their relatives according to their religious customs.

7. No plague case admitted in our mill hospital was inoculated by Mr. Haffkine's serum, except our ward-boy who was inoculated by me in March 1898, but he developed plague this year in the month of March. His name was Sakaram alias Sitaram Bapoo, a Maratha by caste, aged about 20.

8. Amongst the staff, only this ward-boy developed plague, with bubo in the left groin. A month before his sickness, he left the mill premises and was staying close by the mill in Mr. Noor Mahomed's Chawl, Forjett Street, which was highly infected at that time. He was attending to our hospital cases up to the last day of his sickness. So I cannot say, exactly, where he got the infection from. He was admitted, and died two days after admission, on 11th March 1899.

TABLE I.—*Total Admissions during the Year.*

Months.	Plague.	Relapsing Fever.	Observation Cases.	Total.
15	26	1	.....	27

TABLE II.

	Admissions.	Deaths.	Recovery.	Percentage of Mortality.
Plague ... ..	26	18	8	69 per cent.
Relapsing Fever ... ..	1	.....	1	.....
Observation ... ..	.....	.....	.....	.....
Total ...	27	18	9	69 per cent.

TABLE III.

Months.	Total Admissions.	Died within 24 Hours.	Died within 48 Hours.	Total Deaths.	Recovery.	Percentage of Deaths.
15	27	3	6	18	8	69 per cent.

*N.B.*—One relapsing fever case recovered.

TABLE IV.

Total Admissions.	Deaths.	Recoveries.	Percentage of Death.
Males ... ..	16	4	75 per cent.
Females ... ..	2	1	50 „
Children (under 12 years) ..	1	3	.....

*N.B.*—All cases were of Hindu religion.

TABLE V.—*Mortality amongst Sexes and Children.*

Total Mortality for the Year.	Mortality, Males.	Mortality, Females.	Mortality, Children (under 12 Years).
18	15	2	1

TABLE VI.—*Situation of Buboes.*

Situation.			Total.	Males.	Females.	Mortality.	Recoveries.
Cervical	...	...	4	4	.....	3	1
R. Axillary	...	...	5	4	1	4	1
L. "	...	...	5	4	1	3	2
R. Inguinal	...	...	6	4	2	4	2
L. "	...	...	6	5	1	4	2
Total	...	...	26	21	5	18	8

TABLE VII.—*Pneumonic Plague (without Buboes).*

*Nil.*

TABLE VIII.—*Secondary Pneumonia (with Buboes).*

				Died.	Recovery.	Percentage.
Males	...	...	...	4	.....	100 per cent.
Females	...	...	...	.....	.....	.. ..
Children	...	...	...	.....	.....	.....

(a) The physical signs of pneumonia were marked. No bacteriological examination was made.

(b) Pneumonia supervened in two to four days.

#### *Buboes.*

They are chiefly in the groins, in the axillas, and in the cervical region. They appear very irregularly. Sometimes they appear with the rise of temperature and at times a day or two after it. They are always small in size, but very tender and painful.

Buboes which suppurate prolong the life of patients. It is a very hopeful sign.

#### *Complications.*

Cerebral symptoms are very prominent in the acute stage of the disease.

ARDESHIR HORMUSJI GHASWALA, L.M.&S.,

In Charge, The Petit Mills Hospital.

#### *Remarks by the Special Medical Officer.*

A very useful little hospital, situated in open ground and near the mills, and when completed on the principle adopted by the Marathi Hospital, will do good work and serve a useful purpose. Contact sheds should also be erected.



## APPENDIX A.

The official year for the compiling for the Annual Plague Returns for the previous 12 months ends on the 31st May 1899.

All returns for the 12 months will therefore be made up to the above date.

To facilitate the compiling of the returns I have thought it advisable to have a uniform method of Tables and Headings, and I hope that all Medical Officers will adhere as much as possible to these so as to avoid confusion.

In making observation regarding the symptoms and other developments of the disease I want Medical Officers to state facts and to give reasons for statements made. This is more particularly required in Pneumonic Plague where the physical signs of the disease should be given as well as Bacteriological examination where made, and combined with charts, &c.

With regard to Pneumonic Plague, I am aware that only a very few examinations have been made bacteriologically and I think that it would be better to include as Pneumonic Plague all cases of Lung Disease uncomplicated with Buboes, which have died within say 3 days of the development of the disease. This, I think, would cover nearly all cases of Pneumonic Plague.

1. Report on the .....Plague Hospital, Bombay,  
from the.....to.....

2. A history of the foundation of the hospital and when opened ; names of Committee, Medical Officers, List of Medical Staff, *viz.*, Nurses, Hospital Assistants, Ward Boys, &c., &c. Donations to the hospital might also be given.

3. Give a description of the hospital buildings, the numbers of wards and how occupied, dispensary, servants' quarters, contact sheds and number occupying the same.

4. *Conservancy*.—Information regarding the latrines and system of conservancy employed, number of seats, method of disposal of sewage. Also state the method of disinfection of clothes by sweepers previous to washing by dhobies. Any suggestions?

5. Water-supply whence derived.

6. Disinfection of wards and other buildings. Method employed and class of disinfectants used. If the clothes were disinfected by the steam disinfectant, state how often the clothes were sent, and how were they sent to the disinfecting station and how long were they kept there.

7. Method adopted regarding the disposal of the dead. A description of the mortuary. How were pauper patients who died disposed of?

8. Inoculation by Haffkine's serum. Were any of the cases admitted previously inoculated, and, if so, please give full particulars of the number of cases and the sexes, age, &c., and mortality. Give the names of the patients and date of inoculation, and date of attack by plague.

9. Sickness and mortality amongst the staff of the hospital. Full particulars, regarding the nature of the illness, the source of contagion, whether the patient lived on the premises or outside, whether the patient recovered or died.

10. The following tables are to be filled in correctly : —

TABLE I.—*Total admissions during the year.*

Months.	Plague.	Relapsing Fever.	Observation Cases, including all General Diseases.	TOTAL.

The Arthur Road Hospital will supply, in addition to this, tables for Small-pox, Chicken-pox, Measles, &c.

11. The largest number of admissions during any week and on any particular day will be given.

12. Please state the total number of deaths during the year.....Total number of deaths from plague.....Total weekly deaths and percentage of deaths to admissions. Largest number of deaths during any particular day.

TABLE II.

	Admissions.	Deaths.	Recoveries.	Percentage of Mortality.
Plague ... ..				
Relapsing Fever ... ..				
Observation and Other Diseases ... ..				
Total ...				

TABLE III.

Months.	Total Admissions.	Died with- in 24 Hours.	Died with- in 48 Hours.	Total Deaths.	Total Recoveries.	Percentage of Deaths.

The above table is also to be made out separately for Plague and also for Relapsing Fever, except that in Relapsing Fever the deaths within 24 and 48 hours are to be omitted.

TABLE IV.

	Total admissions.	Deaths.	Recoveries.	Percentage of Deaths.
Males ... ..				
Females ... ..				
Children (under 12 years) ...				

The above table is required separately for each caste, *viz.*, Hindus, Mahomedans, Parsis, Christians, Jews, Eurasians, &c.

TABLE V.—Table showing the Mortality for the Year amongst Sexes and Children.

Total Mortality for the Year.	Mortality amongst Men.	Mortality amongst Women.	Mortality amongst Children, (all under 12 Years of Age).

TABLE VI.—Table showing the Situation of Buboes.

Situation.	Total No. of Cases.	Males.	Females.	Mortality.	Recoveries.	Percentage of mortality.
Cervical ... ..						
Parotid ... ..						
R. Axillary. ... ..						
L. " ... ..						
R. Femoral ... ..						
L. " ... ..						
R. Inguinal ... ..						
L. " ... ..						
* Other Situations... ..						
No Buboes ... ..						
Multiple Buboes ... ..						

\* Please state at foot where these were situated, viz., on calf of leg, popliteal space, (arms, trunk, scalp, &c.

TABLE VII.—Table showing Pneumonic Plague (without Buboes).

	Admitted.	Died.	Recovered. ..	Percentage of Mortality.
Males ... ..				
Females ... ..				
Children ... ..				

Vide instruction on page 357 regarding this disease.

TABLE VIII.—Table showing Cases of Secondary Plague Pneumonia ( complicated with Buboes).

	Admitted.	Died.	Recovered.	Percentage of Mortality.
Males ... ..				
Females ... ..				
Children ... ..				

1. In filling in the above tables, Medical Officers are particularly requested to state facts, reasons for diagnosis, whether bacteriological examination was made or not, and by whom.

2. In Table VIII state when the pneumonia supervened.

Notes on the symptoms, character and treatment of the disease.

Period of incubation.—What you have observed on this point and the reasons for your statements.

Symptoms on the disease developing itself or the onset of the disease.

Fever.—The temperatures observed on admission and the course of the disease, giving typical charts of an acute case ending in recovery ; of a mild case ending in recovery, any observations regarding the temperatures—the maximum, the minimum, &c.



*Buboes.*—Their characters and localities. How long after the onset of the disease do they appear; regarding suppuration or subsidence. The subsequent developments, which form of buboes most fatal.

*Complications.*—Such as brain symptoms, suppression of urine, bowel disturbances, hæmorrhage, organic disease of other organs such as eye, &c.

Sequelæ of the disease.

Period of convalescence.

Plague complicated with other diseases. Have you ever observed mumps mistaken for plague?

Numbers of cases which were kept under observation and the disease which they developed.

Treatment of the disease giving full particulars.

Especial mention and notes will be given of all cases which have been subjected to the treatment by the curative serum of Roux and Lustig, and send temperature charts. Give mortality from the treatment and full particulars of the treatment.

## APPENDIX B.

### NOTES ON PLAGUE CASES AMONGST THE STAFF.

#### Maratha Hospital.

	1	2	3	4	5
Name ...	Gopal Powar ...	K. M. Chonker ...	Luxmibai Gopal ...	Ramkrishna Govind.	Balkrishna Ramchandra.
Caste...	Maratha...	Maratha...	Maratha...	Maratha...	Maratha.
Sex ...	Male ...	Male ...	Female ...	Male ...	Male.
Age ...	30	30	Not known	25	25
Employment	*English Hospital Assistant.	Resident Medical Officer.	Not employed in Hospital (wife of No. 1).	*Native Hospital Assistant..	Compounder.
Residence ...	Non-resident in Hospital.	Resident in Hospital.	Not resident	Resident	Resident.
Time of Duty when taken ill.	† Day duty	Night & day duty	.....	† Day duty	Day duty.
Portions of Hospital frequented by in day time.	Wards, dispensary. Slept during off hours in quarters of No. 4.	Entire Hospital	.....	Wards, dispensary, Assistant's quarters.	Dispensary, dispenser's quarters.
Description of quarters if any.	See No. 4	Floor—Mud. Walls—Bamboo ribbing covered with matting. Roof—Galvanised iron.	.....	Floor—Mud and cbunam covered with matting. Walls—Bamboo poles and matting. Roof—Bamboo frames Cocoanut zaolis.	Floor—Mud. Walls—Bamboo ribs covered with matting. Roof—Galvanised iron.
Condition of quarters.	.....	Recently disinfected clean.	.....	Fairly clean.	Fairly.
ILLNESS.					
Date of attack	25th Sept. 1898	30th Sept. 1898	29th Sept. 1898.	5th Oct. 1898.	5th Oct. 1898.
Duration	One day.	3 days.	4 days.	2 days.	2 days.
Death	26th Sept. 1898	2nd Oct. 1898	2nd Oct. 1898	Still living.	Still living.
Symptoms	Pneumonia.	Pneumonia.	Pneumonia.	Pneumonia.	Pneumonia.
Buboes	None.	None	None.	None.	None.
History of exposure to infection.	Nothing special.	Visited No. 1 at home.	Nursed No. 1 at home.	Visited and sent with No. 2 twice.	Visited and compounded for No. 2, also helped to nurse No. 2.
Other history	.....	Cut left hand while opening bubo.	.....	.....	.....
Home address	Thakurdwar Rustomji Patel's chah, Girgaum.	Mugbhat Lane, Girgaum.	Vide No. 1.	.....	.....
Where treated	Home	1st day at hospital then at home	Home.	Hospital.	Hospital.

Remarks—Dispensary structure similar to quarters of No. 2. Smell of rats supposed to have been noticed on 5th October 1898. No dead rats found.

\* In charge of patients under English treatment and native treatment, respectively.

† In alternate weeks on day and night duty.

*Statement of plague cases in the Maratha Hospital Staff.*

(1.) Raghu Sakharan (Corpse bearer) became sick on the 3rd of September but did not report until two days later, when he was found with high temperature and dyspnœa. He was admitted into the hospital and on examination he was found to suffer with pneumonia; there was restlessness, hæmoptysis and high temperature. He died 83 hours after admission.

(2.) Govind Laxnman (ward boy) became sick on 23rd of September, had plague pneumonia and died on 24th—23 hours after admission. This case had no connection with the above case. He was attending on a pneumonia case in the ward.

(3.) Gopal Powar (Hospital Assistant) was on night duty on the 22nd of September. He had to watch a bad case of plague pneumonia and had spent the whole night by the side of the patient giving nutrient enemata, hypodermic injections, &c. On 24th September he was on day duty and after working in the wards till 12 A.M., he went home to his meals, but finding himself feverish, sent word that he was unable to attend duty that afternoon. He was seen at his house by Mr. K. M. Chonker the same evening, and was advised to go to the hospital for treatment. He was admitted next morning, when pneumonia set in. He vomited blood three or four times, was conscious up to last. Died on 26th of September—14 hours after admission. He was attended by his wife who fell ill on 29th of September, and died of plague on 1st October.

(4.) K. M. Chonker, Resident Medical Officer, got a cut on the left index finger while opening a bubo of a plague patient. He cauterized the cut and did not feel in any way uncomfortable up to the night of the 29th of September, when he had a strong chill and rise of temperature. I saw him next morning and found him suffering from pneumonia. He then went to his house in Moogbhat, where I again saw him at 1 P.M. and found the temperature rising and sputa tinged with blood, but there was neither glandular development anywhere or hæmoptysis. During the next two days that he lived, there was no change in the symptoms, but pericarditis set in and dyspnœa became intense. He was seen by Dr. Gallioti on 30th September. He died on 2nd October. He was a well nourished, rather corpulent man with regular habits. He was attended by three persons from the hospital staff.

(5.) Ramerishna Govind (Hospital Assistant), who now and then attended on Mr. Chonker felt feverish on the 4th instant. Dr. Galleoti was kind enough to see him on the 5th and advised him to undergo curative inoculation treatment, but he preferred the treatment of the hospital *Vaidya*. His case was similar to that of Mr. Chonker. He died on 8th October. He was a young man of good constitution and regular habits.

(6.) Balkrishna Ramchandra (Compounder) attended on Mr. Chonker at night. He became ill on the 5th instant. He was treated by the hospital *Vaidya*. He had a small bubo in the right femoral region. He died on the 12th instant.

(7.) Balaji Babaji (Dispensary boy) a relative of Mr. Chonker, who used to attend on him, absented himself from duty on the 6th instant, and died on the 9th. I had no intimation of his illness.

(8.) Heera (Megha Sweeper) reported himself sick on the 6th instant, and was sent to the Arthur Road Hospital for treatment.

(9.) Manekji Dossabhoj (Hospital Assistant) reported himself sick on the 6th instant. I saw him at his house in Sonapur Lane. He is suffering from an attack of Bronchitis. His sickness is due to over work and exposure since the day of Mr. Chonker's illness. He is now much improved but is too weak to attend to his duty.



(10) Harischandra Narayan (Hospital Assistant) reported ill on the 9th instant. He now and then visited Mr. Chonker during his illness, but I think he caught plague in his house situated in Moogbhat Lane, his brother having died on the 8th instant of pneumonia plague. I saw him at his house on the 11th and advised him to go to the hospital, where he preferred the treatment of the hospital *Vaidya*. He had pneumonia, was delirious and died on the 13th instant. His other brother who came to see him also died of the same disease.

(11) Sadasiv Anandrao (Ward boy) who attended on Mr. Balkrishna, Compounder, reported himself sick on the 13th instant. He had very high temperature and strong headache and diarrhoea. He has got over these symptoms and is now convalescent.

REMARKS.—From the above history it would be seen that there was nothing unusual with the sanitary condition of the wards of the hospital. None of the patients from the Relapsing Fever Ward, Observation or Convalescent Ward got bad while the staff was so dreadfully attacked. No one of the staff was inoculated with prophylactic serums, and they were more or less careless of the results of contact with plague patients.

Two rats were found dead in the dispensary room below a cupboard. One cannot say how long the rats lay decomposing there. It is believed that the late House-Surgeon finding the place infected with rats had placed some rough-on-rats here and there and that the rat might have died of the poison. But one thing is certain that the Compounder, the Dispensary-boy and Hospital Assistant, used to sit for hours together in the dispensary room, inhaling the foul air and not minding the stink from the dead rat. I noticed the stink on the 5th instant and removed the dispensary and the office to other sheds close by and disinfected and vacated the quarters.

L. B. DHARGALKER.

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PLAGUE RESEARCH LABORATORY, MAZAGON.

BOMBAY, 12th October 1898.

To J. H. DuBOULAY, Esq., I.C.S.

SIR,—With reference to attached papers, I have the honour to state that I am of opinion that the recently occurring cases of plague among the staff of the Maratha Hospital were due to infection one from the other.

I am inclined to lay special stress on the history in each case, except the first of exposure to infection in a dwelling other than the hospital.

The first case (Gopal Powar) may very possibly have contracted the disease in the performance of his duties.

I visited the hospital again this morning, and found that case No. 4 had died in the meantime, and that case No. 5 was moribund.

Another of the staff has been attacked (on the 10th). In this case also there is a history of infection at home, the man's brother having died recently of plague pneumonia. This man also visited No. 2 before the latter's death on the 2nd instant.

With reference to the hospital arrangements, I consider that the wards are rather crowded, especially in view of the fact that there are a larger proportion of plague pneumonia cases occurring among this community than usual. If it were possible, I think it would be desirable to have this class of cases treated in a separate ward, with extra space per bed, and by special assistants who should be warned as to the



extreme infectiousness of this form of plague. The face should be kept averted as much as possible when examining and attending to the patients. The sputum of such patients is virulently infective, and should be at once disinfected (burnt if possible). Attendants should wash with disinfectants after attending the patient, especially before eating.

I examined the hospital records of these patients under English treatment for the last fortnight, and they showed—

Plague Deaths, Bubonic	...	...	...	69
Do. Pneumonic	...	...	...	17

The recoveries in each class are 12 and 6, respectively. This last figure is too high, and probably includes some recoveries from simple pneumonia.

One small dead rat was found in the dispensary, subsequently to my first visit. I do not attach any importance to this.

I have, &c.,  
F. MAITLAND GIBSON.

### APPENDIX C.

#### **Report on the Steam Bath Treatment of Plague cases at the Mahratta Hospital by Lieut. H. J. R. Twigg, I.M.S.**

In this report, brevity has been aimed at throughout, and to attain that end paragraphs existing in rough copies have been freely omitted.

The text must not be regarded as the most important part: the charts on the other hand have been somewhat elaborated, and a careful study thereof with occasional references to the text should suffice for a clear idea of the results obtained. In addition, the charts give further information not directly bearing upon the Steam Treatment but interesting as regards the incidence of plague during the last outbreak in Bombay.

It was not possible upon administrative grounds to take alternative cases for the Bath treatment: had such a plan been carried out, the process of comparing results would have consisted of mere simple arithmetic.

Certain cases were allotted for Steam Treatment in addition to the treatment in use in the ward in which the particular case was, but although the permission to give cases Steam Baths was freely and generously granted by the Medical staff at the Mahratta Hospital, nevertheless much care had to be exercised to maintain a fair selection of cases. I think it can be truthfully said that the cases were allotted in as fair a manner as could possibly be followed. Allowances have been made in this Report for all departures from an exactly equal distribution. The only condition which at times deterred me from giving a case a bath was feebleness of pulse, but pulmonary complications I considered no contra-indication at all. Late in March, I rejected many cases with feeble pulses, nevertheless the mortality continued very high.

The charts have been divided up into three groups A, B, and C, of very unequal size and importance. Group A, expresses actual results. Group B likewise expresses results, but the interpretation of these results is a fit matter for discussion. Group C is a small and miscellaneous group introducing factors which modify the results of group A. The remaining part of the report contains a brief summary of parts A, B and C. [N. B.—Owing to the large number of charts in the General Report, the Chart of Parts II and III in this Report on steam treatment have not been published.]

Group A is divisible into four parts (1) a Chart A-1 of daily admissions in four colours, each of which denotes a method of treatment save that black is a summary of the three colours red, green and blue, which represent respectively, Bath, Native and "Other Treatments." Two facts must be kept here well in mind. The Bath Treatment was never given alone, but always in conjunction with another treatment. The other fact to be remembered is that "Other treatment" means practically European treatment. It includes, therefore, such methods as the use of hypodermic injections, stimulants, mercurials, antiseptics, alteratives, diaphoretics, and expectorants. A few cases were treated by Lustig's serum, but the numbers were small, the numerical results were unaffected, and the cases occurred early in the use of Lustig's serum method, when it was hardly out of the experimental stage. All these methods have been grouped into one and called "other methods." To sub-divide up the group gives rise to many groups each so small that the results of such are untrustworthy.

Returning to Chart A-1 the following points may be noted :—

- (a) The gradual increase in numbers from January to March.
- (b) The paucity of cases in January.
- (c) The apparent fewness of Bath cases in February, due entirely to administrative changes.
- (d) The great diurnal variation in the number of admissions.

II. The next part of Group A. is No. 2.

The Charts A-2, A-3, A-4, differ from A-1 in being of a twofold character. Firstly, each is merely an extract from a part of Chart A-1, thus, in A-2 the Bath daily admission for clearness are presented alone, in A-3 the Native daily admission are likewise shewn, and in A-4 the "Other method" admissions are similarly given.

Secondly, each chart has a lower line in an appropriate colour. This lower line represents actual recoveries. Thus, to take any one date : let us say, 10 cases come in on that day : then if the recoveries for that day appear as 4, what is meant is that of the 10 cases 4 recovered, but that out of the 10, 6 cases at some time or other, but not necessarily on that particular day, died. Hence the daily percentage of recoveries can be easily deduced.

Returning to these Charts the following points may be noted :—

- (a) In A-2 the few admissions for January : also for reasons already given, the paucity of cases at the end of February.
- (b) In A-3 the increase in numbers with greater uniformity.
- (c) In A-4 the marked increase in numbers. The drop in March is due to the competition for cases on the part of the Bath treatment. Likewise the increase in February is due to the absence of that competition.

II. Chart A-5 is the remaining portion of the second part of Group A. It is apparently a very complicated chart, but really it is very simple. The colours used are for the same purposes as previously stated. The chief points to be noted are :—

- (a) That early in January, when the numbers were small, the results tended to extremes.
- (b) That the daily variations are excessive : for example, a mortality on one day of 100 per cent.: on the next of 0 per cent. and on the third of 100 per cent. again. The small value of such results is obvious.

- (c) A similar state of affairs on a smaller scale obtains as regards the bath during the end of February.
- (d) The greater uniformity and avoidance of extremes obtaining during March when the numbers were high.

Hence these daily charts have been supplemented by others which summarize the former into weekly groups corresponding in time with the weekly returns furnished to the Municipality by the various Bombay Plague Hospitals. By this method a sufficiently large number of cases is guaranteed.

III. The third portion of Group A consists of the next four charts as follows:—

- Chart A-6 is a weekly summary of percentages of recoveries of all cases.
- Chart A-7..... bath cases.
- Chart A-8..... native cases.
- Chart A-9..... "other method" cases.

In each Chart the first and last observations should be disregarded, for the first refers to one day only, namely, 1st January 1899, and the last refers to an incomplete week.

The principal points to be noted are:—

- (a) In A-6 the general high mortality especially in February and middle of March.
- (b) In A-7 the apparent success of the Bath in B, C, & G, and the real comparative success in I, J, K, L.
- (c) The success in C, the want of success in H, and the later success in J in A-8.
- (d) In A-9 the Chart is characterized by uniform excessive mortality.  
*Note.*—Especially F when the mortality was practically 100 per cent.

IV. The last or fourth part of Group A here follows.

The Chart A-10 is of the utmost importance, as it expresses the actual results of the different treatments along with the number of cases upon which the observations are based.

The chief points are as follow:—

- (a) The red line in the Bath cases from January 1st to the next period should not appear, inasmuch as on the 1st January no Bath case was taken, and during the whole of the next week there were only three cases; an insufficient number on which to base any conclusion. It should also be noted that the Native cases were here successful, but only nine occurred.
- (b) The remarks about the smallness of numbers apply to the periods B and C in the Bath cases. During I, J, K, and L, the Bath results are much more uniform and trustworthy.

A stage has now been reached when the question of results can be discussed.

The Charts presented have shown—

- (a) The incidence of daily admissions for all treatments.
- (b) The incidence of daily admissions for each treatment with daily recoveries.
- (c) The daily percentage of recoveries for all and for separate treatments.
- (d) A weekly summary of the above.
- (e) A comparative Chart showing weekly results and total results.



It will be seen that even the most favourable results are unsatisfactory in the extreme. A mortality of 80 per cent. can in no sense be regarded as a success. I am not going to discuss how it is that these results point to the native method as more successful than all others at the Maratha Hospital.

The numerical results, however, stated in Chart A-10, require slight amendment in two respects. An objection has been raised to the effect that whereas many moribund cases must have been admitted to the hospital, practically none could have had Bath treatment, whereas they would have received some treatment or other to the undue advantage of the Bath.

Further it has been stated that the discrepancy in the numerical results can be thereby explained.

To decide this question a definition of the term "Moribund" is necessary. But a practical definition must be such that it enables us to decide, in any particular case whether we have or have not before us a moribund condition. The more one sees of plague the more convinced one is that such a practical definition cannot be given, and one is eventually driven to an arbitrary working hypothesis.

Now, before proceeding to lay down such a working hypothesis, let us assume that the contention is wholly true and that the difference in numbers is, to speak briefly, due to moribund cases. A simple calculation then shows that of the 1,159 "other method" cases, 45 per cent. or nearly one-half must have been moribund; a statement, the absurdity of which is obvious to those who worked in the Mahratta Hospital Wards.

I have, however, adopted an arbitrary definition of what is a moribund case. Practically a case dying within fifteen hours is, in my opinion, a moribund case of those apparently near death on admission, most live eight or nine hours, but the majority are dead within fifteen, of course much latitude must be allowed in such a method of making a definition, as after all the whole definition is a matter of conjecture; but for practical purposes a definition must be made and the best is that which most closely agrees with personal experience.

With such a definition, I find that of the 2,135 admissions 366 were moribund, allotting seven-eighths of these to the "Other Methods" group and one-eighth to the Native group and (unfairly) concluding that no Bath case was moribund, we get the following amended figures for recoveries:—

Native 22 per cent.      Bath 20 per cent.      Other methods 16 per cent.

Another calculation must be made. For various reasons an undue proportion of males to females was selected. The disparity was not large, but as other calculations shew that female cases are rather more often fatal than male cases, the undue allotment of the sexes must unfairly favour the Bath results. [*Vide*, however, latter remarks.]

The figures which establish these statements are briefly these:—

Of 1,164 Plague cases,	77 per cent. were males,	23 per cent. were females.
Of the 960 Non-bath cases,	75    "        "	25    "        "
Of the 204 Bath cases,	82    "        "	18    "        "

Hence, the undue proportion of males in the Bath cases is established. Now turning to mortality we have: total mortality of first 204 Bath cases=75 per cent. of males 72·7 per cent. of females 86·2 per cent. Therefore, had a fair proportion of females been taken, the Bath mortality percentage would have been lower.

The correction necessary for the unequal allotment of the two sexes is, however, a very small one.

Among bath cases in every 22 cases 4 were females.

„ non-bath „ „ 20 „ 4 „ „

Now in 565 bath cases there should be approximately  $\frac{565 \times 4}{22} = 102$  females.

But to be in the same proportion as the non-bath there

should be ... .. 113 „

Therefore a correction of 11 is needed.

But the recoveries among these 11 would only amount to 1 or 2.

Therefore we should have 565+11 cases and 114+1 [or 2] recoveries.

This correction for 576 cases brings the recovery rate to 20·1 per cent. Hence it appears that the correction for sex amounts to less than 1 per cent., and as the definition of a moribund case is quite arbitrary, such a small correction is of little moment.

(The Medical Officer at the Maratha Hospital, however, tells me that during the whole year females did not die so frequently as males. If then the Bath had too few, the Bath has been unfairly treated; but the actual Bath figures give a very different result. The inference is that females are unsuited to the Bath and this is the personal experience of my assistant, Mr. Hate, the nurse and myself.)

We may therefore, as a summary to Part I, conclude that:—

- (1) All methods are very unsuccessful.
- (2) That the difference in mortality between the Bath and Other Methods practically does not exceed 5 per cent.

The remaining parts of the report are only of secondary importance though, perhaps, of more interest than the first part.

The full Bath treatment is of two parts, firstly, the Vapour Bath in which steam surrounds the patient excepting the head, and secondly, the Hip Bath in which the patient sits in a bath of tepid or cold water.

There are some who are great believers in the use of the Hip Bath, but it is absolutely opposed to all my ideas of what is suitable to a plague patient; further, I, in common with many others, firmly believe that I have seen plague cases quickly rendered much worse by its use. And my own personal experience is that whenever I have exposed myself to similar conditions, although in good health at the time, I have myself been the worse for such an exposure.

I could never therefore allow myself to submit any but the earliest Bath cases to the latter part of the treatment. Mr. Leslie attributes the difference between the results of the first quarter and last three quarters of this investigation to the fact that in the former the cold bath was at times used and in the latter was never used; further he thinks that without any drugs or other treatment at all the Bath cases would have done better on a purely hydropathic method of treatment.

## PART II.

An account now follows of what happens to a patient who has a vapour bath.

The first 150 odd cases had careful notes taken as to pulse and respiration, if possibly every three minutes, and also observations upon sweating, delirium, nausea, coughing, urination, defaecation and any noteworthy occurrence. In addition a nurse noted the pulse respiration and temperature before and after the patient left the ward. The whole proceeding as a rule lasted 45 minutes, the patient's bath commencing 9 minutes and ending about 35 minutes after the nurse had taken the



first notes on the case. The nurse's later notes were usually taken 45 minutes after the earlier notes. They were given to me at the end of the day, and appended to my own notes. Some sphygmograms were also taken, but were soon given up.

Sixty Charts dealing with fifty-one patients have been prepared [the small numbers represent time in minutes, respiration in red, pulse blue, and temperature black. The temperatures are only those before and after the bath].

These observations were made with a view to learning whether various types of plague cases, acted in uniform or characteristic manner ; whether any prognostic points could be established and whether any indications for treatment might be made out. The results are largely negative.

The Charts lettered B have to do with the question of what happens to the pulse and respiration immediately before and after and during the Bath. As to what happens an hour or more after the bath, I have nothing definite to state, as apparently no two cases acted alike, and the return to the condition existing before a bath was given was never a process allowing of the formation of any rule.

These Charts by themselves do not shew much, but when taken in conjunction with the experience of the whole bulk of the Bath cases, a few points may be made out. These points, however, have never been disputed and are not new; the results here shown merely confirm their truth :—

- (1) Of all the successful cases the majority are those in which neither the pulse rate nor the respiratory rate are very high.
- (2) Whenever condition (1) holds good, then should the changes in pulse and respiration go hand in hand, that is, should the red and blue lines be approximately parallel, then the case usually does well.
- (3) That of all bad conditions, a high pulse rate, especially if the tension be also low, is the worst.
- (4) A high respiration rate with pulse rate, which is nevertheless not much accelerated, is not particularly unfavourable. (Cases No. 385 and 673 do not appear to agree with these statements.)

These statements after all merely amount to saying that of all complications cardiac complications are the most serious ; that if the circulation and respiration go on in harmony, the case is favourable, two very important functions not being much disturbed. I think slight pulmonary troubles do not contra-indicate the Bath.

When a patient has a bath, the pulse and respiration shew the following changes. The combined changes are of more importance than the changes occurring in either of them alone ; for that reason the following description refers to the two functions together.

Unless very rapid at the beginning, the pulse rate is increased and the tension slightly raised ; about two minutes later the rate is still further increased as also is the tension ; then rather suddenly the latter markedly drops, and the volume and rate increase. These changes are preceded by alterations in the respiration, consisting of a gradual increase in rate but not in depth, to be broken by a sudden and marked increase in depth in the breathing. This increase in depth of respiration usually occurs first after the sudden diminution in pulse volume referred to. Another thing to be noted is that early in the respiratory changes, coughing frequently occurs as if an effort is made to expel any mucus which may by chance exist in the air passages. Quickly following on the respiratory and circulatory changes, we have sweating, which usually is synchronous with the increased depth of breathing referred



to ; after that, there is a gradual return to the original condition of the pulse and respiration except that the deep breathing persists somewhat longer than the other phenomena. Usually within two hours, I have found the patient has returned to his former state. A marked feature in many cases, and experienced on every occasion upon which the author took a bath, was slight dizziness and throbbing of the cerebral vessels coming on after the advent of sweating. Personally for four or five hours after the bath, a sense of well-being was most marked and on one occasion a slight bronchial catarrh was much improved.

Sweating comes on usually when the patient has been in the bath twelve minutes ; but the time varies between 4 and 25 minutes. In many cases presenting a few scattered râles in the chest much improvement was noticed, and reviewing the whole series, I think these were the cases most benefited by the bath. There can be no doubt that much relief is afforded the majority of the patients, delirium especially being relieved. The sweating which generally occurs also is a source of great relief, though at the time of its immediate onset, the circulatory and respiratory changes referred to cause a little discomfort. Urination is very common ; the cases of retention of urine were very few ; defæcation also occurs, but less commonly, and I understand that many of the cases took their food better after the bath. It is to be expected from these remarks that some degree of improvement occurred in many cases, but unfortunately the results shew that the relief is relief only, and not cure and that symptoms only, and not the real disease have been controlled. This is borne out by the effect of repeated baths ; each bath gives relief, but in my opinion the relief afforded by the second is less than that afforded by the first and so on for the third. That a patient after eight or nine baths should recover, does not, I think prove that the baths saved him. Before pursuing this matter, however, I will now introduce Part III in which the question will be again brought forward.

### PART III.

Three Charts are presented in this part. In the earlier part of this investigation, I thought that the Bath cases lived longer than the Non-bath cases. To test this belief, the first hundred odd fatal cases in each group were carefully classified and sixty pairs were selected. During the process of selection the number of days the patient lived was quite unknown, having been noted in a different note book which was not consulted until a couple of weeks later. Age, sex, time of admission, number of days sick, type of disease, locality, caste and occupation were all considered, and pairs as similar as possible were selected. The result was unexpected in one respect, namely, that the tendency to prolongation of life was wholly in favour of the bath. The results are expressed on Chart C-1. There the red line is throughout above the blue line denoting that bath cases live longer, though on the average only a day or two. I do not know whether this feature was maintained during the later period of the investigation ; in March so rapidly did the Bath cases die that the difference between the two methods could only be very slight. But it does shew that no harm was done to the patients.

On page 367 I have stated in what ways I think the bath gives relief. But if one bath can give relief, then why should not several continue that relief and materially aid the recovery of the patient. My experience is that such continued relief is not what actually occurs, and that the relief afforded by the first bath generally exceeds that of the second bath and so on. What the bath does is chiefly in the direction of stimulating afresh the many and varied functions of the body—circulation, respiration, digestion, excretion, secretion, and so on in a probably complex manner. A little thought will lead one to realize what a powerful therapeutic agent a vapour bath is and how much the whole body is brought under its influence. That it should be a

powerful stimulant, meaning thereby a potent agent in bringing about changes in the body is, I think, not to be wondered at. Such improvement as occurs is to be attributed, I think, to the resumption of functions previously more or less deranged as the result of the diseased state of the patient, but it must be remembered that for the great part this resumption is only temporary. The old abnormal state is quickly re-established and with each bath the stimulus become less and less.

With the cold bath we have other things to consider. In nearly all feverish conditions when we apply a cold bath after a hot bath, the risk of inducing shock is great, but never in it greater than when we have to deal with a disease such as plague, in which cardiac enfeeblement is only too common. In addition the visceral congestion induced in the pelvic organs and lower abdominal regions must, in my opinion, together with the risk of shock, quite condemn the use of the cold bath.

Chart C-2 calls for a little attention. It was my original intention to gather from the large collection of statistics I have accumulated, numbers enabling me to shew graphically the varying successes of the bath and the non-bath treatments at different ages of life; also among different castes and among different occupations. Had these results for the bath and the non-bath treatments been widely divergent, the inference would have been that the bath at certain ages or among certain castes or among certain occupations had been markedly potent either for evil or for good. The result as regards age is shewn in Chart C-2 where for the most part there is not much difference. The most favourable age for the bath is 25—30 while over 40 bath cases do badly. I do not know that any other inference can be fairly drawn and with results so scanty I was deterred from pursuing my inquiries into caste and occupation. Moreover, there must be many other circumstances which must quite overshadow all these, for example, as Dr. Dhalgakar has pointed out to me, the question whether the patient is well fed or nearly starved on admission.

For the last Chart C-3, I am indebted to the kindness of Mr. Moos, Director of the Observatory, Colaba. I asked for curves for temperature, barometric pressure and humidity, and was kindly supplied with the same together with some of the results gained at Colaba in connection with Plague. Apparently Mr. Moos considers ground temperature a most important factor in this propagation of plague and probably the connection is very close. I was induced to ask for the curves represented inasmuch as with the climatic changes noted during the course of February and March, there were marked changes (for the worse) in the results for all treatments. At one time I fancied the meteorological changes might have in some way modified the conditions favouring sweating, and so have accounted partially for the increased bath mortality; but as all methods of treatment showed increased mortality, some other cause must be sought for.

[ *Addendum*, 17-7-99 ].

#### CHART C-4.

Added to shew the results obtained at the end of every week from January the first, 1899.

The most marked feature is the decline in the success of the bath, but it must be noted that the comparative success only occurred when a small number of cases was taken.

### CONCLUSION.

Part I deals with actual results, Part II deals with certain phenomena occurring during the administration of the hot bath, and Part III, along with miscellaneous questions deals with the alleviative as opposed to the curative nature of the steam treatment. Bath and Non-bath methods alike have, at the Maratha Hospital, been



failures, and while the Non-bath methods have not been curative, the bath method can certainly, in my opinion, claim to have been more alleviative than its competitors. As to what would have been its results had the cold bath been rigidly enforced, I will not say. In the words of the Medical Officer at the Maratha Hospital "whatever cases may have recovered here, have recovered by means of processes not brought about by us but have got well of themselves."

In conclusion I must thank the Medical Officers and staff at the Maratha Hospital for their assistance; also Mr. Moos for his Chart relating to meteorological factors, and Mr. Leslie I must thank for two reasons; firstly, for providing me with an excellent opportunity for studying plague, and secondly for providing me with a really excellent assistant, quite indefatigable in work and always willing—Mr. Hate upon whose shoulders fell more than a fair share of the work in this investigation. But the Report is wholly my own and for it I alone am responsible. Its delayed completion has been due to occupation elsewhere and temporary indisposition.

## APPENDIX D.

### Appendix to the Report of the Modikhana Plague Hospital, Bombay, for 1898-1899.

#### *Report of Cases treated with Roux's Serum.*

#### General Remarks.

The Indian Plague Commission brought along with them a large quantity of anti-plague serum prepared in the Institute Pasteur in Paris under the direction of M. Roux, with the intention of trying its efficacy on a large scale.

The first trial of the serum was conducted at Bangalore.

During the months of January and February 1899, the Modikhana Hospital was selected for a further trial, and the close proximity of the hospital to the Municipal Laboratory, where the Members of the Commission were engaged in carrying on research work in plague, was found to be a great advantage to them.

The treatment was carried out by Lieutenants Walton and Douglas of the Indian Medical Service, who were assisting the Plague Commission in their Laboratory work, and the cases were watched from time to time by Professor Wright and Dr. Rüffer. A detailed account of the action and results of the serum on the cases tried in the Modikhana Hospital, and of its action on lower animals will appear in the Report of the Indian Plague Commission.

The following brief sketch is only intended to give a little idea of the manner in which the treatment was carried out.

#### Number and Selection of Cases.

There were altogether twenty-eight cases of acute plague treated with Roux's Serum. These cases were not specially selected for treatment, but every alternate case as it was admitted into the acute plague ward, was taken for serum treatment, the remaining cases forming the "Controls." This arrangement was thought to be better adapted for comparing the result of the serum treatment with that of the routine treatment as carried on in the hospital.

Of the 28 cases treated with serum—

10 were brought into the hospital on the 2nd day.

6	"	"	"	"	3rd	"
5	"	"	"	"	4th	"
2	"	"	"	"	6th	"
1	"	"	"	"	8th	"

In 4 remaining cases the duration was unknown.



**Mode of treatment.**

The injections were generally given deep into the cellular tissue of the anterior abdominal wall, sometimes in the interscapular region, and in a few cases intravenously. In all cases the strictest antiseptic precautions were taken; the syringe and the skin being carefully sterilized. In not a single case were local abscesses formed at the seats of injections.

The injections were given twice daily. The first dose was, with only a few exceptions, 40 cubic centimetres, all the subsequent doses being 20 cubic centimetres each. The total amount of serum injected varied from 40 cubic centimetres upwards, and the largest amount injected into a single individual was 235 cubic centimetres, (Serial No. 9) who however died. In the case of Rama Narayan (Serial No. 17) who was ultimately discharged cured, 220 cubic centimetres of serum were injected.

In all of these cases the ordinary routine treatment for plague, *viz.*, stimulants and strychnine injections, was allowed to be carried on simultaneously with the serum.

**Effects on Symptoms.**

The injections, as I have said before, were given both intracellularly, as well as intravenously, and without any accidents. In general, it may be said, that there was no effect observed as the result of the injections. The temperature, pulse, and respirations were in no way affected, and the serum, even when injected in the proximity of a bubo, did not appear to influence it in any manner. It produced no beneficial effect upon the delirium. The intravenous injections apparently created no influence on the pneumonic condition.

It may be mentioned at the same time, however, that there were certainly no ill-effects observed to be arising from the injection and use of the serum. No irritation or urticaria was produced at or around the seats of injection.

**Result.**

Of the 28 cases treated, 5 recovered and the remaining 23 died, thus giving a mortality of 82.1 per cent. Out of an equal number of "Controls" there were 3 recoveries and 25 deaths, mortality percentage being 89.9. Thus the percentage of recoveries from the serum treatment does not show any striking results as compared with those obtained from the ordinary treatment.

The result, therefore, was unsatisfactory and disappointing, especially as in Laboratory experiments Roux's Serum had shown a decided antagonising action to the toxins of plague.

Of the five recoveries, in the case of Dhondoo Trimbeck, the bubo gradually subsided, in the remaining four the buboes suppurated and had to be incised.

A tabular list is herewith appended giving details of the cases treated; also Charts showing four hourly temperature, pulse, respirations, the amount of serum injected and the time of injection.

D. A. TURKHUDD,  
Chief Medical Officer, Medikhana Hospital.

*Analysis of Cases treated with Roux's Serum in the Modikhana Hospital, Bombay.*

Serial No.	Register No.	Name.	Caste.	Sex.	Age years.	Date of Admission.	Day of Illness.	Bubo.	Complications.	Total Serum Injected.	Result.	Remarks.
1	1654	Gopal Jant	Hindoo	Male.	28	28th January 1899	2nd	R. Femoral..	Violent Delirium ..	160 C. C. M.	Discharged 1st February 1899 ..	Bubo subsided.
2	1656	Dhondoo Tribhak	"	"	23	28th do.	6th	L. Axilla ..	Secondary Pneumonia ..	188 "	Discharged 6th March 1899 ..	
3	1659	Purshotum Jogi	"	"	35	29th do.	3rd	R. Inguinal ..	Do.	140 "	Died 2nd February 1899 ..	
4	1671	Paulla Mahadgo	"	"	28	29th do.	3rd	R. Axilla ..	Do.	158 "	Died 3rd February 1899 ..	
5	1680	Vithu Nathu	"	"	28	30th do.	2nd	L. Inguinal ..	Secondary Pneumonia ..	60 "	Died 1st February 1899 ..	
6	1686	Janu Paya	"	"	40	30th do.	2nd	R. Femoral..	Do.	60 "	Died 31st February 1899 ..	
7	1697	Tatyadas Kannath ..	"	"	45	1st February 1899	3rd	L. Inguinal..	Do.	140 "	2nd February 1899 ..	
8	1700	Sukhlabram Mangroo	"	"	30	1st do.	2nd	L. Inguinal..	Do.	140 "	Discharged 17th March 1899 ..	Bubo suppurated.
9	1708	Gulam Inaudin	Mahomedan.	"	18	2nd do.	2nd	R. Axilla ..	Do.	235 "	Died 6th February 1899 ..	
10	1712	J. Fernandes ..	Christian.	"	40	2nd do.	2nd	R. Inguinal..	Do.	100 "	Died 4th do.	
11	1716	Daji Babaji ..	Hindoo	"	30	2nd do.	8th	R. Inguinal ..	Do.	140 "	Discharged 23rd May 1899 ..	Do.
12	1720	Laxman Rania	"	"	35	3rd do.	4th	R. Inguinal ..	Do.	40 "	Died 3rd February 1899 ..	
13	1722	Mahadgo Kondoo ..	"	"	30	3rd do.	3rd	R. Submaxillary ..	Secondary Pneumonia Dis- plasia.	100 "	Do. 6th do.	
14	1730	Raghoo Gungaji	"	"	30	3rd do.	4th	R. Femoral..	Do.	40 "	Do. 3rd do.	
15	1738	Dhondoo Sadoo	"	"	22	4th do.	2nd	R. Inguinal ..	Secondary Pneumonia ..	135 "	Do. 7th do.	
16	1743	Mang Jaga ..	"	"	25	4th do.	2nd	R. Inguinal ..	Do.	113 "	Discharged, 15th March 1899 ..	Do.
17	1745	Rama Narayen	"	"	29	5th do.	3rd	L. Femoral ..	Secondary Pneumonia ..	220 "	Do. 23rd do.	Do.
18	1747	Dhondoo Deoji	"	"	24	5th do.	4th	R. Axilla ..	Much infiltration around bubo.	150 "	Died 8th February 1899 ..	
19	1762	Dhondoo Bhanaji	"	"	30	5th do.	2nd	R. Axilla ..	Secondary Pneumonia ..	80 "	Do. 7th do.	
20	1766	Mania Vithoo	"	"	25	6th do.	2nd	R. Femoral ..	Do.	140 "	Do. 9th do.	
21	1775	Narayen Ooma	"	"	14	7th do.	6th	L. Groin ..	Do.	80 "	Do. 8th do.	
22	1773	Kaboo Purbata ..	"	"	25	6th do.	2nd	R. Axilla ..	Do.	80 "	Do. 8th do.	
23	1763	Bapu Halbata ..	"	"	40	6th do.	4th	L. Axilla ..	Secondary Pneumonia ..	120 "	Do. 10th do.	
24	1783	Sukka Rama ..	"	"	24	7th do.	2nd	L. Axilla ..	Do.	80 "	Do. 9th do.	
25	1786	Sukharam Krishna	"	"	12	8th do.	4th	L. Axilla ..	Do.	40 "	Do. 8th do.	
26	1788	Prayag Gaheshe	"	"	30	8th do.	2nd	R. Inguinal ..	Do.	80 "	Do. 8th do.	
27	1805	Govind Rania ..	"	"	25	9th do.	3rd	R. Inguinal ..	Do.	40 "	Do. 9th do.	
28	1804	Ramjee Raghoo	"	"	25	15th do.	2nd	R. Femoral ..	Do.	135 "	Do. 15th do.	

D. A. TURKHUD,

*Chief Medical Officer,  
Modikhana Hospital.*

## APPENDIX E.

**A short History of Lustig's serum as used in Bombay.**

In November 1897, Professor Lustig wrote from Florence, to the Health Officer, stating that as the experiments with serum prepared according to his method had proved very satisfactory on monkeys and men, his Assistant, Dr. Galeotti, would go to Bombay to prepare the serum there provided his journey and actual expenses were paid. The letter met with the approbation of the Health Officer, Col. Weir, who states that the results of the treatment adopted by Professor Lustig were most encouraging. Professor Lustig had been originally sent out to Bombay by the British Government, and conducted a number of experiments with his serum which Dr. Choksy, the Medical Officer in charge of the Arthur Road Hospital, reports as the only serum which gave anything like satisfactory results, as out of 7 cases treated with this serum 6 recovered, and at Lanowli 16 cases were treated and 12 recovered.

2. On the strength of these favourable reports, the Municipality decided to accept the services of Dr. Galeotti, and a wire was sent to Professor Lustig to that effect, also to ascertain if he had any serum ready and how long it would take to prepare fresh serum in Bombay.

3. In answer to this, Professor Lustig wired to say that no serum was ready and that four weeks would be required to prepare the serum which he proposed to send out by Dr. Galeotti. The Municipal Commissioner, Mr. Snow, in return wired to say that as much serum as could be prepared should be sent out by Dr. Galeotti, and that a weekly supply be sent (February 1898). Professor Lustig then proposed that if the trials resulted in a successful termination, he would come himself (with the sanction of the Italian Ministry) to Bombay and set up an Institution for its preparation. This was in February 1898.

4. On March 11th, Dr. Galeotti arrived in Bombay, and the experiments with Lustig's serum were taken in hand. In April Dr. Choksy was called on for a report of the cases inoculated and stated, on the 22nd April, that it was feared that if any deductions were to be drawn from those already treated at such an early stage, no definite conclusions would be arrived at, but that the percentage of recoveries amongst those treated is about 50 per cent. In a further communication, dated 25th April, he states that the number of patients treated amounted to 103; 84 of whom were treated at the Arthur Road, 10 at the Maratha, and 9 at Parel Hospitals. That the serum obtained from Horse No. 1 was comparatively weak and gave less satisfactory results than the other animals. Of the 103 cases treated, 18 were very advanced and grave, including some that were pneumonic and unconscious. These cases were treated to see the effect of the serum on them, and the result found was that there was some amelioration and considerable improvement in their symptoms, albeit of a temporary nature, although they eventually succumbed. The rate of recovery in these cases was 42·71 per cent., and eliminating the 18 grave cases, the recoveries were 51·77 per cent. The average mortality at the Arthur Road Hospital at this time was 73·55. Thus the serum gives encouraging results.

5. The Standing Committee, on the 27th April, resolved that the serum be distributed as far as possible to the various Plague Hospitals and also, if possible, to the Plague Authorities at Karachi.

6. The question of the expenditure concerning the proposed Laboratory for the manufacture of serum locally was then gone into, and sanction given to the neces-



sary appliances required, as Dr. Galeotti wished the manufacture to be begun without delay, as in a few weeks the supply of serum from Florence would cease.

7. In May a further list of cases treated with this serum was sent in from the Arthur Road Hospital. 155 cases were treated and 95 died, giving a mortality 61·29 per cent. against an average mortality of about 82 per cent. amongst cases treated without serum. Amongst these 95 cases 25 were moribund, and if these are deducted a reduction to 53·84 per cent. would be obtained. The serum from No. 1 Horse was again found weak and gave less favourable results. (*Vide* letter No. 518 of 1898 from the Arthur Road Hospital.)

8. The services of Dr. Galeotti and Dr. Polverini (his Assistant) were taken on by the Corporation from the 1st June 1898 for the manufacture of the serum.

9. In September a further list of cases treated by Lustig's serum was sent in by Dr. Choksey. The total number of cases treated were 207, out of which 117 died and 90 recovered, giving a mortality of 56·50 per cent. Out of these cases 30 were moribund cases which, if excluded, would give a mortality of 49·15 per cent. The results, even including the 30 moribund cases, are nearly 20 per cent. better than the average of other hospitals. It was again found that there was amelioration of symptoms and prolonging of life in very advanced cases. (*Vide* letter No. 21067 of 1898-99, from the Executive Health Officer.)

The total number of cases treated with the serum sent out from Florence, up to the end of October was 257; of these 145 died and 112 recovered, giving a mortality rate of 56·42 per cent. During the same period 752 cases were treated without serum, and of these 595 died, and 157 recovered, giving a mortality rate of 79·12 per cent.

10. In October 1898, the necessary number of horses, *viz.* 5, and the apparatus required for the manufacture of this serum was obtained, and the Laboratory at Parel started work. The horses were inoculated from the 1st November. A 6th horse and a donkey were purchased in January 1899.

11. On the 6th December, from an infiltration on the shoulder of one of the horses, serum was obtained and a very severe case of plague treated with it at the Arthur Road Hospital with satisfactory result. On the 11th January, 2 horses had completed their course of treatment, and from the serum obtained from them, on the 15th and 16th January, cases were treated a couple of days after.

12. Professor Lustig came out to Bombay to see the working of the Laboratory as conducted by Dr. Galeotti and Polverini at Parel at the end of January 1899, and as the result of his investigations, letter No. 32724 of the 1st February is published, and will be found very interesting.

No. 32724 OF 1ST FEBRUARY 1899.

TO THE MUNICIPAL COMMISSIONER.

Sir,—I have the honour to forward herewith a very interesting and valuable memorandum by Prof. Lustig on the measures that have been taken for the preparation of the curative serum of Prof. Lustig. It is very gratifying to find that Prof. Lustig is thoroughly satisfied with all that has been done. His opinions on the destruction of rats are most interesting in view of the experiments that have been made since 1896.—I have, &c.,

T. S. WEIR, Health Officer.

MEMO.

1. Having obtained from the Italian Government leave only up to the 10th of February, I must start from Bombay, and I regret it is impossible for me to give my evidence before the Plague Commission.

2. I beg to forward to the Commissioner a memorandum giving briefly my opinion on the different subjects on which I have been requested to express my views.

3. Further explanations can be given by my Assistant, Dr. Galeotti, Lecturer at the University of Florence, and by myself by letter, if the Commission find it necessary.

4. The aim of my coming to Bombay has been to pay a visit to the laboratory arranged by my Assistants, Drs. Galeotti and Polverini, and to have personal information of the arrangements for the preparation of the curative serum.

5. I am very pleased to be able to express to the Commissioner that I have found the work of Drs. Galeotti and Polverini completely satisfactory in every regard, and I should be very glad if the Plague Commission would pay a visit to this Laboratory and examine the operations for the preparation of the serum and the experiments for the immunisation of horses and other animals.

6. Now, it will be seen from the several works published by myself and Dr. Galeotti in different scientific papers that we had in our researches, the object of extracting from the plague bacilli a very active substance of known constitution able to induce in the animals in which this substance has been injected, a strong local and general reaction, by means of which the serum of the blood of these animals attain specific bactericidal and antitoxic properties.

7. Our experiments were in the beginning performed on animals (rabbits, rats, guinea-pigs, monkeys) and later on [? on human beings] (July and August 1897) in Bombay and Poona with a serum prepared in Florence. With this serum we treated 30 patients in different stages of disease, and of these 24 recovered.

8. In February 1898, I was charged by the Municipality of Bombay to prepare serum in my Laboratory at Florence, and to send it here for the treatment of the plague patients in the hospitals of this town.

9. Every time, before the sending out of the serum, I tested its preventive and curative power on rats, injecting them in the peritoneal cavity with a small quantity of a very virulent plague culture.

10. I did not determine the minimum curative doses, because I think that such determinations have no conclusive value, it being impossible to have a standard of the strength of the injected virus.

11. I can only say with certitude, that  $\frac{1}{3}$  or  $\frac{1}{4}$  C.C. of serum was able to save a white rat of 100 grains weight, if the serum was injected under the skin 2 or 3 hours after the intraperitoneal infection with cultures able to kill rats in 12 to 18 hours.

12. These experiments show that the serum of the No. 4 horse was the most active, and that of the No. 1 horse was the weakest.

13. The results are in accordance with the experiments made with the same serums on plague patients.

14. With these experiments the Plague Commission have been acquainted by Dr. Galeotti and by other witnesses who had occasion to examine the treated cases and it would be useless to report these results.

15. Now I have found the horses treated by Dr. Galeotti in good condition, and I hope they will give an active serum.



16. The first assays made by Dr. Galeotti on rats gave very satisfactory results, and these result will be communicated to the Plague Commission together with those of the following experiments by Dr. Galeotti himself.

17. In accordance with my personal experience on the preparation of curative serum in general and specially in regard to the preparation of the antiplague serum, I must say that not all the horses are able to give a serum imbued with sufficient curative properties, and that some horses are able to give a good serum only after a long process of repeated inoculations.

18. I believe that the strength of the serum prepared, following my method, is due to the presence in the blood of substances elaborated by the cells of the organism of the horses, during the general reactions, which follows every inoculation.

19. When the activity of the serum is in proportion to the number and strength of these reactions, the horses, able to give strong reactions, will furnish surely an active serum.

20. On the contrary, the horses in bad condition of nutrition and in which the material exchange is abnormal, show, after the inoculations, phenomena of improverishment and topor, and are not able to give a sufficiently strong serum.

21. For this reason, it is necessary to keep the horses quiet for some time after the first blood letting and before making new inoculations.

22. I have requested Dr. Galeotti to give to the Plague Commission the most detailed information about the experiments which will be done on plague patients with the serum of the horses which are now under treatment, and also, in regard to the researches designed to determine on rats, with the greatest exactness possible, the strength of the serum of every treated horse.

23. Being requested by the Municipal Commissioner to express my opinion on the importance of rats in the diffusion of the plague, I offer the following :—

1st. I have performed experiments on hundreds of rats of different races, and living in the most different conditions, and I have found that almost all are able to get plague.

2nd. Keeping in a cage several infected and non-infected rats, all die in a short time, and in their bodies plague microbes are always to be found.

3rd. Mixing a virulent plague culture with the food given to some rats, all these generally die from plague, and it is quite common to find the bacilli in their fæces.

4th. Generally in the infected rats the microbes enter the blood, and with great facility they pass into the urine ; thus this urine becomes a very infectant liquid.

5th. In 1897, I had occasion to examine at Poona some dead rats found in a granary, and in these I found plenty of microbes. I investigated also the corn of this granary, but I did not discover any plague microbes in it. Nevertheless, I know that 2 cooks who ate of this corn died from plague a few days after.

6th. I believe that the rats represent one of the most important means of diffusion of the disease, because they are able to carry everywhere virulent microbes.

7th. The destruction of the rats is one of the most important measures to be taken against the plague. For this purpose poisons can be very useful, and specially would it be useful to provoke amongst the rats another epidemic, with a microbe not virulent to man. For this purpose, I believe that the Lassar's microbe would be



the best, because it was used with satisfactory results in Thessalia some years ago. I got a culture of this microbe and tried it on white mice, and obtained a culture which was very virulent, but I had not success with the black rats. I know that the same was experienced by Dr. Galeotti, to whom I sent one of my cultures of Lasar's microbe. Dr. Galeotti will receive in a short time from Plague another more virulent culture of the same microbe, and will repeat the experiments.

DR. A. LUSTIG,  
Prof., R. University, Florence.

No. 5444 OF 1898-99.

BOMBAY, 9th February 1899.

Copy forwarded to the Municipal Secretary for the information of the Corporation.

W. L. HARVEY, Commissioner.

13. Dr. Choksy being called on for a report on the cases inoculated at the Arthur Road Hospital, during January and February, with the new serum manufactured at Parel, his letter No. 325 of 1899 is herewith published, with a table of cases. Dr. Dargalkar of the Maratha Hospital also forwards a table of cases inoculated at that Hospital by Drs. Galliotti and Polverini.

No. 325 OF 1899.

ARTHUR ROAD HOSPITAL,  
BOMBAY, 18th March 1899.

TO LIEUT.-COL. J. S. WILKINS, D.S.O., I.M.S.,

SPECIAL MEDICAL OFFICER,

PLAGUE OPERATIONS.

SIR,—I have the honour to forward herewith statistics of the cases treated with Professor Lustig's serum during the latter end of January and the month of February 1899.

The cases are divided into 6 Series as follow :—

Series.	Horse No.	No.	Died.	Recovered.
1	5	18	14	4
2	2	11	8	3
3	3	17	10	7
4	2	13	11	2
5 (to be continued)..	1	8	5	3
6 (do. )	4	1	0	1
Total..	.....	68	48	20

Of the 68 cases treated during the period, 48 died and 20 recovered, giving mortality rate of 70·60 per cent., the hospital mortality in January and February was 82·83 per cent. and 79·41 per cent. respectively.

I have, &c.,  
(Sd.) N. H. CHOKSY, KHAN BAHADUR,  
Extra Assistant Health Officer.

## SERIES I.—HORSE NO. 5.

General No.	Serial No.	Date of Admission.	Names.	Age.	Sex.	Caste.	Duration.	Bubo.	Quantity Injected.	Died.	Recovered.	REMARKS.
1	1	29th January...	Girja, wife of Alloo..	10	F.	Hindu	2 days	Right cervical	28 c.c.	31st Jan. 1899	...	Temperature 106.4° death from gradual heart failure.
2	2	28th "	J. J. DeSilva	61	M.	Christian	6 "	Left inguinal and femoral.	20 "	30th "	...	Injected on the 6th day; died 4 hours after injection.
3	3	31st "	Unknown	42	M.	Hindu	Not known.	Right inguinal	45 "	1st Feb. 1899.	...	Moribund; life kept up by stimulant injections.
4	4	31st "	Mahadu Ittoo	10	M.	Do.	4 days	Left axillary	85 "	.....	Recovered.	Septic type; profuse malaria; bubo suppurated; good recovery.
5	5	1st February.	Bambhoo Ragu	20	M.	Do.	Do.	Do.	30 "	1st Feb. 1899.	..	Moribund; died 12 hours after admission.
6	6	"	Rama Rago	20	M.	Do.	Do.	Right inguinal	135 "	.....	Recovered.	Septic type; recovery without suppuration of bubo.
7	7	"	Shuna Yessoo	40	M.	Do.	2 days	Left axillary with infiltration.	145 "	.....	Do. ...	Septic type; recovery with suppuration.
8	8	"	Ganesh Khedoo	38	M.	Do.	Do.	Right axillary and pectoral.	70 "	4th Feb. 1899.	...	Improvement and then relapse.
9	9	"	Bironji, wife of Ganesh.	25	F.	Do.	3 days	Left inguinal	95 "	4th "	...	Meningeal symptoms Hematemesis.
10	10	2nd "	Devola Gainoo	18	M.	Do.	Do.	Right axillary, Right cervical infiltration.	40 "	3rd "	...	Multiple buboes.
11	11	1st "	Yessoo Kandaji	30	M.	Do.	5 days	Do. do.	15 "	2nd "	...	Injected on the 2nd; died 2 hours after injection.
12	12	2nd "	Genoo Gosai	29	M.	Do.	3 days	Left femoral, inguinal and iliac.	15 "	3rd "	...	Moribund; died 6 hours after injection.
13	13	"	Pardoo Gopal	15	M.	Do.	1 day	Right do.	73 "	5th "	...	Semi-conscious on admission.
14	14	3rd "	Shiwa Hari...	30	M.	Do.	4 days.	Left inguinal	75 "	6th "	...	Death from failure of heart.
15	15	4th "	Aba Bala	32	M.	Do.	7 (?)	Left inguinal, femoral and iliac. Right parotid.	125 "	12th "	...	Lived for 8 days; death from oedema of lungs.
16	16	6th "	Govind Haroo	25	M.	Do.	3 days	Right inguinal and iliac.	100 "	8th "	...	Heart very feeble, life prolonged by stimulant injections.
17	17	30th January..	Miss S. P.	16	F.	Parsee	2 "	Right femoral and iliac.	511 "	.....	Recovered.	Had a relapse in the shape of an iliac bubo on the left side.
18	18	8th February	Ramchandra Narayan	20	M.	Hindu	4 "	Right femoral	140 "	21st Feb. 1899.	..	Died 14 days after admission from oedema of lungs.

## SERIES II.—HORSE NO. 2.

General No.	Serial No.	Date of Admission.	Names.	Age.	Sex.	Caste.	Duration.	Bubo.	Quantity Injected.	Died.	Recovered.	REMARKS.
19	1	3rd February ...	Marooti Jamba...	25	M.	Hindoo	6 days.	Right femoral...	20 c.c.	6-2-99	.....	Injections stopped, as it was a case of tetanus and aphasia.
20	2	2nd February...	Jani, wife of Bhawoo ...	20	F.	Do.	3 "	Do.	15 c.c.	3-2-99	.....	Moribund; died 2 hours after injection.
21	3	Do.	J. Aveline Fernandez ...	18	F.	Christian	2 "	Right axillary ...	100 c.c.	... ..	Recovered.	Good recovery without sup- puration of bubo.
22	4	Do.	Tribhuvan Govind ...	18	M.	Hindu	2 "	Right femoral...	110 c.c.	.....	Do.	Septic type, good recovery, bubo suppurated.
23	5	Do.	Dewa Tunba ...	28	M.	Do.	4 "	Left femoral and iliac.	45 c.c.	5-2-99	.....	Almost unconscious. Temp. 105°-106° heart failure.
24	6	Do.	Marooti Santoo ...	35	M.	Do.	4 "	Left inguinal and axil- lary.	110 c.c.	7-2-99	.....	Almost unconscious. Life pro- longed by stimulant injec- tions.
25	7	4th Do.	Samboo Ganoo ...	2½	M.	Do.	3 "	Right femoral...	10 c.c.	6-2-99	.....	Feath from sudden failure of heart.
26	8	Do.	Jannabai, daughter of Dalal.	6	F.	Do.	2 "	Right axillary ...	30 c.c.	6-2-99	.....	Epileptic convulsions. Oedema of lungs.
27	9	5th Do.	Soma Mitha ...	50	M.	Do.	1 "	Right inguinal...	16 c.c.	.....	Recovered.	Septic type, good recovery without suppuration.
28	10	Do.	Salvador Noronha ...	40	M.	Christian	3 "	Left femoral, inguinal and iliac.	140 c.c.	23-2-99	.....	Death 18 days after admission, from exhaustion, from sloughing of iliac bubo.
29	11	Do.	Shiwham Bhawoo ...	12	M.	Hindu	2 "	Left femoral and ingui- nal.	30 c.c.	6-2-99	.....	Death from sudden failure of heart.



SERIES III.—HORSE No. 3.

General No.	Serial No.	Names.	Age.	Sex.	Caste.	Duration.	Bubo.	Quantity Injected.	Died.	Recovered.	REMARKS.
30	1	Dagoo Janoo ...	10	M.	Hindu	1 day	Left femoral ...	60 C. C. ...	9th Feb. 1899	.....	Death from heart failure.
31	2	Dhondoo Bhairoo ...	30	"	Do.	3 days	Right inguinal ...	125 " ...	17th " ...	.....	Do. do. exhaustion.
32	3	Jai, wife of Tukaram.	50	F.	Do.	4 "	Right femoral and iliac, Right axillary.	55 " ...	8th " ...	...	.....
33	4	Pari, wife of Bapuji	20	"	Do.	2 "	Right axillary ...	140 " ...	.....	Recovered.	28th February 1899, bubo resolved.
34	5	Baloo Takoo ...	18	M.	Do.	1 day	Do. ...	2 0 " ...	8th Feb. 1899	... ..	Moribund, died 8 hours after one injection, gradual heart failure.
35	6	Bhawansing Raising	12	"	Do.	2 days	Left femoral ...	55 " ...	.....	Recovered.	Septic type, good recovery without suppuration.
36	7	Dhondoo Sagoo ...	19	"	Do.	1 day	Left femoral and iliac.	145 " ...	.....	Do. ...	Septic type, good recovery with suppuration.
37	8	Rose M. DeSilva ...	22	F.	Christian.	2 days	Right posterior cervical, left femoral.	20 " ...	.....	Do. ...	27th February 1899, bubo resolved.
38	9	Khondi, daughter of Balwan.	12	"	Hindu	1 day	Right axillary ...	115 " ...	14th Feb. 1899	.....	.....
39	10	Shamji Pitamber ...	40	M.	Do.	3 days	Right femoral infiltration.	20 " ...	13th " ...	.....	Death from sudden heart failure 7 hours after one injection.
40	11	Dhondoo Sakaram ...	25	"	Do.	3 "	Right femoral and inguinal.	125 " ...	18th " ...	.....	Death from oedema of lung.
41	12	Mrs. K. ...	45	F.	Parsi	4 "	Do. do. ...	40 " ...	11th " ...	.....	Diabetes mitral regurgitation.
42	13	Miss K. ...	18	"	Do.	1 day	Left femoral and inguinal.	68 " ...	.....	Recovered	.....
43	14	Mr. M. ...	25	M.	Do.	3 "	Left axillary ...	80 " ...	.....	Do. ...	Bubo suppurated.
44	15	Chimi, wife of Bapoo	40	F.	Hindu	1 day	Right femoral ...	70 " ...	15th Feb. 1899	.....	.....
45	16	Jeeji Khandu ...	12	"	Do.	3 days	Left axillary with infiltration.	82 " ...	.....	Recovered.	.....
46	17	Sonu Babaji...	30	M.	Do.	3 "	Left femoral, Right axillary, Right posterior cervical.	40 " ...	22nd Feb. 1899	.....	Died 12 hours after injection ; multiple buboes.

SERIES No. IV.—Horse No. 2.

General No.	Serial No.	Date of Admission.	Names.	Age.	Sex.	Caste.	Duration.	Bubo.	Quantity Injected.	Died.	Recovered.	REMARKS.
47	1	21st February	... Joda Horsayal	40	M.	Hindu	4 days	... Left femoral, inguinal and iliac.	20 c. c.	21-2-99	.....	Died 3 hours after one injection, moribund. Controlled, died.
48	2	"	... Jeva Kalla	18	M.	Do.	2	... Rt. axillary with infiltration.	20 c. c.	22-2-99	.....	Death from sudden heart failure. Controlled, died.
49	3	"	... Parbhoo Narsoo	30	M.	Do.	3	... Left axillary	60 c. c.	22-2-99	.....	Death from secondary pneumonia. Control, died.
50	4	"	... Hirralal Taw	45	M.	Do.	3	... Left femoral	120 c. c.	2-3-99	.....	Death after 10-days from secondary pneumonia. Control, recovered.
51	5	24th	... Nama Rama	35	M.	Do.	2	... Rt. inguinal	120 c. c.	27-2-99	.....	Control, died.
52	6	23rd	... Ganoo Chandria	22	M.	Do.	3	... Left axillary with infiltration.	140 c. c.	27-2-99	.....	Injected on the 24th. Control, died.
53	7	24th	... Gungaram Dhoda	50	M.	Do.	2	... Rt. femoral and inguinal	120 c. c.	28-2-99	.....	Control, died.
54	8	"	... Shanker Sooka	5	M.	Do.	2	... Left femoral	35 c. c.	.....	Recovered.	Recovered without suppuration of bubo. Control, died.
55	9	"	... Ragoo Krishna	32	M.	Do.	3	... Rt. post cervical	80 c. c.	25-2-99	.....	Control, died.
56	10	25th	... Sakaram Rapoo	18	M.	Do.	2	... Left axillary, left post cervical.	60 c. c.	26-2-99	.....	
57	11	26th	... Dhondoo Vittoo	12	M.	Do.	3	... Left axillary	15 c. c.	24-2-99	.....	Died 5 hours after one injection, moribund.
58	12	25th	... Ganpat Essoo	22	M.	Do.	2	... Rt. inguinal	20 c. c.	26-2-99	.....	Injected on the 3rd day, died 7 hours after injection.
59	13	15th	... Mr. R. P. K.	6	M.	Parsi	1	... Left femoral and inguinal	49 c. c.	.....	Recovered.	Bubo resolved. No control.

SERIES V.--HORSE No. 1.

General No.	Serial No.	Date of admission.	Names.	Age.	Sex.	Caste.	Duration.	Bubo.	Quantity injected.	Died.	Recovered.	REMARKS.
60	1	24th February...	Bale Khan Hasan ...	18	M.	Hindu ...	3 days ...	Left inguinal ...	120 c. c.	2-3 99	.....	Septic type, death from secondary pneumonia.
61	2	26th "	Rama Dagroo ...	25	M.	Do. ...	" ...	Left axillary ...	50 c. c.	27-2 99	.....	Died from sudden heart failure. Control, recovered.
62		26th "	Bhoo Babaji ...	19	M.	Do. ...	" ...	Rt. femoral and iliac ...	120 c. c.	3-3-99	.....	Septic type, death from heart failure. Control, recovered.
63	4	26th "	Runa Begla ...	30	M.	Do. ...	" ...	Left femoral and inguinal...	80 c. c.	28-2-99	.....	Died from edema of lungs. Control, died.
64	5	27th "	Mahadoo Tanoo ...	27	M.	Do. ...	3 "	Rt. parotid with infiltration on neck and chest.	14 c. c.	.....	Recovered...	Recovery with suppuration of bubo and infiltration.
65	6	28th "	Yedoo Ranea ...	6	M.	Do. ...	3 "	Rt. femoral ...	25 c. c.	.....	Do.	
66	7	27th "	Kashibai ...	27	F.	Do. ...	1 "	Do. ...	110 c. c.	.....	Do.	
67	8	28th "	Mr. S. P. C. ...	40	M.	Parsi ...	1 "	Left femoral and inguinal.	55 c. c.	2-3-99	.....	Sudden failure of heart.
68	1	27th "	J. K. (6th Series) ...	14	M.	Hindu ...	4 "	Axillary ..	70 c. c.	.....	Recovered.	



Statement of work done by Dr. Galiotti with new Serum at the Maratha Plague Hospital up to 28th February 1899.

Register No.	Names.	Sex.	Age.	Occupation.	Residences.	Date of Admission.	Date of serum injected.	Amount of serum injected.										REMARKS.
								1st day.		2nd day.		3rd day.		4th day.		5th day.		
								Morning.	Evening.	Morning.	Evening.	Morning.	Evening.	Morning.	Evening.	Morning.	Evening.	
697	Maroti Gopal	Male	20	Mill-hand	Dongri, Muarri Sati's house	2nd February	1st February	15	15	10	...	...	...	...	...	...	Recovered.	
714	Narbada Luxuman	Female	18	Do.	.....	2nd	1st	18	15	15	15	19	19	19	...	...	Died 8-50 p.m. 6-2-99.	
720	Sakoo Malay	Do.	35	Cooly	Segregation Camp, Maratha Hospital	3rd	2nd	20	...	10	...	10	...	...	...	...	Died 6 p.m. 6-2-99, Vapour bath given.	
753	Bhiku Ranji	Male	6	Nil	Wari Bunder Segregation Camp	3rd	2nd	5	12	10	...	...	...	...	...	...	Died 4-30 p.m. 4-2-99.	
761	Uma Mahadu	Female	15	Nil	No. 2, Gilder Street	3rd	2nd	...	10	10	15	10	...	...	...	...	Recovered.	
767	Dugdoo Honaji	Male	30	Cooly	127, Nowroji Hill, North	4th	3rd	19	19	18	19	...	...	...	...	...	Died 7-50 p.m. 5-2-99	
776	Sai Sukaram	Female	15	Do.	Appa Telli's Chawl House No. 9.	4th	3rd	15	...	...	...	...	...	...	...	...	Died 5 a.m. 7-2-99, Vapour bath given.	
797	Kalapa Basapa	Male	20	Do.	84, Bhandari Street	5th	4th	15	19	19	...	19	...	...	...	...	Recovered.	
838	Babaji Narayan	Do.	30	Mill-hand	Thoba Wani's Chawl	7th	6th	10	19	...	19	...	19	...	...	...	Died 12-30 p.m. 11-2-99.	
842	Narayan Bhawoo	Do.	25	Cooly	Kharwachi Wadi Fire Brigade, Girgaum	7th	6th	...	19	19	...	19	15	...	10	...	Died 7 a.m. 11-2-99.	
848	Ganoo Kaloo	Do.	30	Do.	2nd Nagpada, Huzuri Moholla	7th	6th	15	...	19	...	...	...	...	...	...	Died 10 a.m. 10-2-99.	

Mortality 72.7 per cent.

(Sd.) L. B. DHARGALKER.

The cases on which the serum was tried were practically selected ones.

14. In March Dr. Galeotti was called on for a report as to whether, in view of the unfavourable results of his serum, the experiments should be continued, and in answer he forwarded his letter dated 29th March 1899 :—

TO THE EXECUTIVE HEALTH OFFICER,  
OF THE MUNICIPALITY OF BOMBAY.

SIR,—With reference to your No. 35963 of 25th of March, I have the honour to state—

(1) That I am not fully acquainted with the results of experiments made on animals by the Plague Commission with the serum prepared locally. My own experiments, however, are not at all unsatisfactory, and I beg to annex herewith a statement showing the results upon monkeys and rats.

(2) The observations made in hospitals up to date,—136 patients, of whom 91 have died and 45 recovered, giving a mortality rate of 66·91 per cent. against about 80 per cent. in cases not treated with the serum.

(3) In my experiences last year with the first supply of serum obtained from Florence, it was found that this first serum was weak and its strength improved with subsequent bleedings. 64 cases were treated in Bombay with the first supply from Florence, and of these 40 died and 24 recovered, giving a mortality rate of 62·5 per cent., which shows that the first supply of Florence serum gave about 4 per cent. better results than that made in Bombay. But this year we have to contend against a most virulent epidemic, when during some period the hospital mortality was over 85 per cent.

(4) I am of opinion, therefore, that a further trial, with the second supply of serum, is necessary to decide its efficacy, and that it would be premature to draw any conclusions, favourable or unfavourable, at present ; and I would therefore propose that the experiments might be continued until the second supply of serum is fully tested, and I think in about one month or 6 weeks time, the number of observations will be sufficient to enable us to judge of its effects.

(5) I have reason to believe that the Special Medical Officer, appointed by the Surgeon-General with the Government of Bombay, is favourably impressed with the results achieved up to the present from the study of the cases treated.

(6) It must, however, be remembered that the serum can have a limited action in the class of patients admitted into Arthur Road Hospital, and that under the circumstances, even with the strongest serum, the results will be of a limited value. But if it were intelligently applied in private practice, where medical men have opportunities of seeing patients on the first day of disease, the results would be more successful, and I should suggest that the second quantity might be placed at their disposal with the necessary directions, and if some charge were made on each bottle of serum supplied, it would be, I am sure, most willingly given.

I have, &c.,  
DR. GINO GALEOTTI.

BOMBAY,  
PAREL, the 29th March 1899.

*Experiments with the serum of the horse No. 5.*

Animals.	Weight in grammes.	Quantity of infecting injections.	Curative injections with the serum.	Results.
White Rat No. 1 ...	120	$\frac{1}{4}$ of one c. c. ...	After 3 hours $\frac{1}{2}$ c. c. After 27 hours $\frac{1}{4}$ c. c.	Cured.
White Rat No. 2 ...	100	$\frac{1}{4}$ <i>id.</i> ...	After 3 hours $\frac{1}{2}$ c. c. After 27 hours $\frac{1}{4}$ c. c.	Cured.
White Rat. Control ...	110	$\frac{1}{4}$ <i>id.</i> ...	No injections ...	Died after one day.
Monkey No. 1 ...	2,000	2 c. c. ...	After 3 hours 5 c. c. After 27 hours 5 c. c.	Cured.
Monkey. No. 2 ...	2,500	3 c. c. ...	After 3 hours 5 c. c. After 24 hours 5 c. c.	Died after six days.
Monkey Control ...	2,100	2 c. c. ...	No injections ...	Died after four days.

The animals were all injected on the morning of the 12th January with an emulsion of an agar-agar plague culture. The injections were made under the skin.

*Experiments with serum of the horse No. 4.*

Animals.	Weight in grammes.	Quantity of infecting injections.	Curative Injections with the serum.	Results.
Monkey. Control. ...	2,300	1 c. c. ...	No injections. ...	Dead after five days.
Monkey E. ...	2,400	1 c. c. ...	After 5 hours 5 c. c.... After 27 hours 5 c.c...	Dead after six days.
Monkey F. ...	1,900	1 c. c. ...	After 5 hours 5 c. c.... After 27 hours 5 c.c...	Cured.
Monkey G. ...	2,400	1 c. c. ...	After 5 hours 5 c. c.... After 24 hours 5 c.c...	Cured.

The animals were all injected on the 25th February with an emulsion of an agar-agar plague culture.

*Experiments with the serum of the horse No. 1.*

Animals.	Weight in grammes.	Quantity of infecting injections.	Curative injections with the serum.	Results.
White Rat No. 1 ...	.....	$\frac{1}{8}$ of one c. c. ...	After 3 hours $\frac{1}{4}$ c. c. „ 24 hours $\frac{1}{4}$ c. c.	Cured.
White Rat. Control ...	.....	<i>id.</i> ...	No injections...	Dead after one day.
Monkey C ...	2,400	2 c c ...	After 3 hours 5 c. c. After 24 hours 5 c. c.	Cured.
Monkey D ...	1,900	<i>id</i> ... ..	After 3 hours 5 c. c. After 24 hours 5 c. c	Dead after eight days.
Monkey. Control ...	1,950	<i>id</i> ...	No injections...	Dead after five days.

The animals were all injected on the 20th February with an emulsion of an agar-agar plague culture. The injections were made under the skin.



*Experiment with the serum of horse No. 3.*

Animals.	Weight.	Injections made on the 7th February.	Curative injections.	Remarks.
White Rat No. 1 ...	100	Piercing the tail with an infected needle.	After 3 hours $\frac{1}{2}$ c. c. After 27 hours $\frac{1}{2}$ c. c.	Cured.
White Rat No. 2 ...	... ..	<i>id.</i> ... ..	After 3 hours $\frac{1}{2}$ c. c. After 27 hours $\frac{1}{2}$ c. c.	Cured.
White Rat, No. 3 ...	.....	<i>id.</i> ... ..	After 3 hours $\frac{1}{2}$ c. c.	Dead on the 10th February
White Rat Control ...	.....	<i>id.</i> ... ..	.....	Dead on 8th February.
Monkey A ... ..	4 pds.	Injection of 2 c. c. culture.	After 5 hours 5 c. c. After 27 hours 5 c. c.	Cured.
Monkey B ... ..	2 pds.	<i>id.</i> ... ..	After 5 hours 5 c. c. After 24 hours 5 c. c.	Cured.
Monkey. Control ...	$4\frac{1}{2}$ pds.	<i>id.</i> ... ..	.....	Dead on 12th February.

No. 100 OF 1899.

BOMBAY, 5th April 1899.

TO THE MUNICIPAL COMMISSIONER.

SIR,—With reference to your No. 7719 of 24th March 1899 and 7841 of the 27th idem, I have the honour to forward herewith a letter from Dr. Galeotti reporting on the results of experiments made with the serum on monkeys and rats and to state my opinion on the subject.

A certain expenditure has already been incurred which now amounts to about Rs. 1,800 per month and a number of animals have been under treatment and are in a certain stage of preparation

It appears to me therefore that the advice given by Dr. Galeotti in the 4th para. of his letter is sound, namely, “that a further trial with the second supply of serum is necessary to decide its efficacy, and that it would be premature to draw any conclusions, favourable or unfavourable, at present ; and I would therefore propose that the experiments might be continued until the second supply of serum is fully tested, and I think in about one month and six weeks’ time the number of observations will be sufficient to enable me to judge of its effects.”

This advice deserves the more serious consideration inasmuch as the serum treatment is the only form of remedy that offers any hope of reducing the mortality amongst the sufferers from plague. I believe a second supply of serum can be obtained after a month.

Dr. Galeotti also refers to observations made by the officer appointed by the Surgeon General. The results of such observations, although as yet I know not their nature, should be obtained and no doubt they will be supplied in time.

The last suggestion of Dr. Galeotti that the second supply of serum should be offered to the Medical practitioners in private practice is a good one.

I believe there is a feeling in the Medical profession that the serum should be given a further trial. At any rate the Medical men in the Corporation might have an opportunity—and no doubt they would desire an opportunity—of expressing an opinion on the matter.

I have, &c.,  
T. S. WEIR,  
Health Officer.

In consequence of the explanation given the Standing Committee resolved to continue the experiments for six weeks longer.

15. Dr. Choksy sent in a further Report on the cases treated during February and March and April and his remarks are very interesting as showing the increasing strength of the serum.

No. 403 of 1899.

ARTHUR ROAD HOSPITAL,  
BOMBAY, 12th April 1899.

TO THE MUNICIPAL COMMISSIONER,  
THROUGH THE SPECIAL MEDICAL OFFICER  
AND THE EXECUTIVE HEALTH OFFICER.

SIR,—In conformity with the Executive Health Officer's No. 36094 of the 20th ultimo, I have the honour to submit the following report and returns showing the results obtained by Professor Lustig's serum.

2. During February 1899, 68 cases were treated with Professor Lustig's serum of whom 48 died and 20 recovered, giving a mortality rate of 70·58 per cent. The mortality of the cases not treated with serum during the same period was 79·16 per cent. The results therefore show 8·58 per cent. in favour of the serum cases.

3. During March 1899, 74 cases were treated of whom 49 died and 25 recovered, giving a mortality rate of 66·21 per cent. as against 79·48 per cent. in cases not treated with the serum. The results in this month are 13·27 per cent. in favour of the serum cases.

4. The following table contrasts the mortality rate amongst the two classes of cases :—

	Mortality rate of cases treated with serum.	Mortality rate of cases not treated with serum.	Difference.
February ... ..	70·58	79·16	8·58
March ... ..	66·21	79·48	13·27

5. As regards the cases treated with the serum, it may be noted that all cases that were moribund and all those that had gone over six or seven days and were either semi-convalescent or convalescent were excluded, so that the cases injected with the serum represented a fairly average type of the most acute cases. The mortality rate amongst the cases not treated with the serum would have been higher were it not for the fact that a large number of semi-convalescent and convalescent cases are included amongst them, and they have thus contributed in favour of the non-serum cases. If anything the better results with the so-called "selected" cases treated with the serum have been more than counterbalanced by the latter.

6. The serum treatment was put to as severe a test as possible during the height of an epidemic which has been known for its extreme virulence. And so much so that during some periods in February and March the mortality amongst the admissions ranged between 85 to 90 per cent. That the serum can and does reduce the mortality rate even in an epidemic of the present type is therefore beyond doubt.

7. The following tables give the details of the cases treated :—

*February.*

Series.	Horse No.	Bleeding.	No. Treated.	No. Died.	No. Recovered.
I.	5	First.	18	14	4
II.	2	Do.	11	8	3
III.	3	Do.	17	10	7
IV.	2	Do.	13	11	2
V.	1	Do.	8	5	3
VI.	4	Do.	1	...	1
		Total ...	68	48	20

*March.*

V. ( <i>contd.</i> )	1	First.	9	7	2
VI. "	4	Do.	46	30	16
VII.	6	Do.	13	8	5
VIII	5	Do.	6	4	2
		Total ...	74	49	25

I have, &c.,

N. H. CHOKSY,

Extra Assistant Health Officer, Arthur Road Hospital.

Forwarded to the Commissioner (Municipal) through the Deputy Commissioner.

JAMES S. WILKINS,

Special Medical Officer.

12th April 1899.

No. 479 OF 1899.

ARTHUR ROAD HOSPITAL,

3rd May 1899.

TO THE MUNICIPAL COMMISSIONER,

THROUGH THE SPECIAL MEDICAL OFFICER

AND THE EXECUTIVE HEALTH OFFICER.

SIR,—I have the honour to submit herewith the following report and return of cases treated with Professor Lustig's serum during April 1899 :—

The number of cases treated was 39 of whom 21 died and 18 recovered, giving a mortality rate of 53·84 per cent. The mortality rate of cases not similarly treated was 77·51 per cent., thus showing a difference of 23·67 per cent. in favour of the former.

2. The cases were divided into the following series:—

Series.	Horse No.	Bleeding.	No. treated.	No. Died.	No. Recovered.
VIII	5	Second	16	10	6
(completed)					
IX	Donkey	First	2	1	1
X	3	Second	14	7	7
XI	1	Do.	7	3	4
(to be continued)					
		Total ...	39	21	18



3. From a comparison of the returns for February, March and April it appears that each succeeding month the serum shows better results as it becomes stronger and more active. And considering that the present epidemic did not show any marked decline till about the middle of April and that the individual cases do not even yet show any marked diminution in their virulence, in spite of the fact that the epidemic is steadily declining, the results, so far achieved, should be considered satisfactory. This is better illustrated by the following table which compares the results during the period :—

Months 1899.	Mortality rate of cases not treated with the serum.	Mortality rate of cases treated with the serum.	Difference in favour of serum cases.
February ... ..	79·16	70·58	8·58
March... ..	79·48	66·21	13·27
April ... ..	77·51	53·84	23·67

The above table shows that whereas the mortality rate has varied very little amongst the cases not treated with the serum, it shows a very appreciable improvement in those treated with it, and the improvement has steadily bettered from 8·58 per cent. to 23·67 per cent., a difference of over 15 per cent.

4. When all the series of cases are compared, two points are clearly brought out, viz:—(1) that the serum obtained from the second bleedings is more active than from the first and (2) that the serum from the different horses shows different degrees of activity :—

Series.	Horse. No.	Bleeding.	No. Treated.	No. Died.	No. Recovered.
I.	5	First.	18	14	4
II.	2	Do.	11	8	3
III.	3	Do.	17	10	7
IV.	2	Do.	13	11	2
V.	1	Do.	17	12	5
VI.	4	Do.	47	30	17
VII.	6	Do.	13	8	5
VIII.	5	Second.	22	14	8
IX.	Donkey.	First.	2	1	1
X.		Second.	14	7	7
XI.		Do.	7	3	4
Total...			181	118	63

The above statement indicates that the result from the first and second bleedings were 68·38 per cent. and 55·81 per cent. respectively, thus clearly showing a difference in greater activity of 12·57 per cent. from the latter, and as the serum gets stronger at each subsequent bleeding it is to be expected that better results would be shown in the near future. The serum supplied from Florence last year also showed similar variations between the first and second bleedings.

The table further demonstrates that different horses give serums of different activities, and this also materially corroborates the experience of last year, when it was observed that the different horses under experiment at Florence gave serums of different curative values.

5. Including the observations made last year, the total number of cases treated with Professor Lustig's serum now amount to 439, and the following deductions have been drawn from the experience thus acquired :—

- (1.) That the only known method of treatment that holds out any hope of reducing the high mortality from Plague, is that by Professor Lustig's curative serum.
- (2.) That where the serum does not avert death, it considerably ameliorates the symptoms and prolongs the life of the patient.
- (3.)—That the serum has and cannot but have a limited value in the treatment of the class of patients admitted into the Arthur Road Hospital — patients drawn from the lowest strata of society, badly housed, badly nourished or half-starved, the houseless, the friendless, and the vagrant, picked up from the streets and byelanes of the City and brought to the hospital in a moribund or semi-moribund condition, and after the vital organs had become thoroughly disintegrated from saturation with the plague poison.
- (4.) That if the mortality rate in such patients could be reduced by even 15 per cent., the results should be considered extremely satisfactory.
- (5.) That the serum treatment has long since passed the experimental stage, and that its use should be freely encouraged, so as to collect data on the largest scale possible.
- (6.) That with a view to test the full efficacy and value of the serum, it should be used extensively in early cases and also in those that are allowed to be treated in their houses by private practitioners.
- (7.) That the best method of using the serum in hospital practice is to exclude all moribund and all convalescent and semi-convalescent patients and treat the rest.
- (8.) That if the method above indicated were not followed, it would lead to much unnecessary waste of serum which could be better applied in more suitable cases.
- (9.) That the statistical method is not the only method of judging of the efficacy of the serum, as it takes no cognizance of the effects in individual cases, and that clinical observation should not be totally ignored, as it is of as much, if not more, value in determining its effects.
- (10.) That if any statistical method has to be relied upon for purposes of comparison, it should be between the cases treated with and without serum, after the moribund, the convalescent and semi-convalescent have been excluded from each class.
- (11.) That this method even is not free from objections, inasmuch as it takes no account of the individual differences in castes and races, sex, age, location of buboes, duration of illness at the time of treatment and the general condition of the patient, &c., &c.,—factors which considerably influence the mortality rate in plague patients, and which must, to a great extent, be similar if not actually identical in the two classes of cases taken for comparison.
- (12.) That it is not generally possible to obtain such exact control cases, even if the admissions into the hospital be very large, and that all

deductions drawn from comparison of control cases, that do not fulfil the above requirements, are open to doubt and are proportionately of less relative value.

- (13.) That, in the absence of such exact control cases, the method suggested in para. 10 is the only one feasible and practicable, and open to least errors, especially if a large number of observations are made, the larger the better.
- (14.) That the treatment of every alternate case, as has been suggested, is liable to even greater objections than the method suggested in para. 10, as it would entail the waste of serum in moribund cases—cases that nothing short of a miracle could revive, as also its further waste upon convalescent and semi-convalescent patients who are already on the high road to recovery, and who require no further active treatment by drugs or by serum to complete their cure.

I have, &c.,

N. H. CHOKSY,

Medical Officer in charge Arthur Road Hospital.

No. 1737 of 3RD MAY 1899.

Forwarded, with compliments, to the Commissioner through the Special Medical Officer.

T. S. WEIR,

Health Officer.

DY. COMMISSIONER,

Dr. Choksy's interesting letter is forwarded to the Commissioner for his information. The results will help the Committee to form an idea of the value of the serum treatment. I think there is no doubt that the results are improving. I have asked Dr. Choksy to use the serum at the Arthur Road Hospital on the same plan as that adopted by Roux's serum at the Modikhana, viz., using it on every second case, using the first as a control. He has promised to do so from the beginning of the month. I think the results will be interesting, as the virulence of the disease still continues and the mortality is still high.

JAMES S. WILKINS,

Special Medical Officer.

3rd May 1899.

Submitted.

(Sd.) J. H. DUBOULAY.

3rd May 1899.

A—A of Dr. Choksy's report may be forwarded to Government and the Corporation, unless further detail is required. I rather think the Surgeon-General has asked for more regarding the March returns. I shall be glad if Col. Wilkins will kindly let me know what Capt. Childe is doing regarding the testing of the serum and whether the cases given by Dr. Choksy include cases treated by private practitioners. We should have the latter also.

(Sd.) W. L. HARVEY.

5th June 1899.

DY. COMMISSIONER,

The returns called for by the Surgeon-General for March are sent in to-day.

Capt. Childe did no serum treatment as far as I am aware; but a Parsee Medical man was detailed by the Surgeon-General and under the orders of Capt. Childe; this man took careful notes of all the inoculations done in the Municipal hospitals (at Arthur Road and Maratha) and reported the same to Dr. Childe.



I have sent Dr. Choksy a note regarding the concluding para. of the Commissioner's remarks, and will send him further information on the subject.

In continuation of my remarks on Dr. Choksy's report, and especially in reference to the table in para. 3, I think it ought to be noted that, although there is an idea that the cases selected for inoculation must have been favourable ones, and that the unfavourable cases were not inoculated, the mortality amongst the non-inoculated which, one would think, ought, in consequence, to be higher than the general rate of mortality in other hospitals, is a matter of fact about the same. This perhaps shows that Dr. Choksy's selections were fair and unbiased, and that the serum did account for the difference between the inoculated and non-inoculated on its own merits.

(Sd.) JAMES S. WILKINS,  
Special Medical Officer.

5th May 1899.

## SERIES VIII.—(continued.)—Horse No. 5.—(2nd Bleeding.)

Genl. No.	Serial No.	Date of admission.	Names.	Age.	Sex.	Caste.	Duration.	Bubo.	Quantity Injected	Died.	Recovered.	REMARKS.
1	7	2nd April	John Nicholson	35	M.	N. Christian.	3 days	Left axillary	150 c. c.	8-4-99.	.....	Septic type with pneumonia, life prolonged for 6 days.
2	8	3rd "	Baithazar DeSouza	37	"	Christian.	2 "	Right femoral	90 c. c.	6-4-99	.....	Heart failure, violent delirium before death.
3	9	3rd "	John Simon	41	"	N. Christian.	2 "	Left femoral	70 c. c.	5-4-99.	.....	Acute œdema of lungs, heart failure.
4	10	4th "	Sudboo Jaipal	30	"	Hindoo	2 "	Right axillary	45 c. c.	6-4-99.	.....	Acute œdema of lungs, do. do.
5	11	6th "	Nama Savala	25	"	Do.	3 "	Right femoral and iliac	67 c. c.	8-4-99.	.....	Sudden heart failure.
6	12	6th "	Tayaba Bapooji	45	"	Do.	4 "	Double inguinal	75 c. c.	9-4-99.	.....	Septic type, was one of a series of 6 cases of one family, all died.
7	13	6th "	Narayan Gungaram	13	"	Do.	2 "	Left femoral	50 c. c.	8-4-99.	.....	Moribund, life prolonged for 2 days.
8	14	7th "	Abdool Rahiman	25	"	Mussalman.	4 "	Right cervical	100 c. c.	.....	Recovered...	.....
9	15	9th "	Narayan Sing Jaivalsing	25	"	Hindoo	2 "	Left femoral	145 c. c.	17-4-99	.....	Death from sudden acute œdema of lungs and heart failure, 8 days after injection.
10	16	10th "	Dayaldas Gomalidass	25	"	Do.	3 "	Left femoral and inguinal.	70 c. c.	.....	Recovered...	.....
11	17	.....	Runchor Kanji	10	"	Do.	3 "	Right axillary	45 c. c.	.....	Do. ...	.....
12	18	.....	Felix Gonsalvis	16	"	Christian.	4 "	No bubo	60 c. c.	.....	Do. ...	Plague bronchitis and malaria.
13	19	.....	Ahmed, R. M. D.	15	"	Mussalman.	1 "	Right femoral	85 c. c.	Died.	.....	.....
14	20	.....	Rahimbhai, M. D.	42	"	Do.	1 "	Left inguinal	105 c. c.	.....	Recovered...	.....
15	21	.....	Regodass Mulla	17	"	Hindoo	4 "	Left axillary	40 c. c.	.....	Do. ...	.....
16	22	.....	Cakoo Tulsec	12	"	Do.	4 "	Left femoral	10 c. c.	Died.	.....	Tetanic case, injection stopped.

\* Cases treated by private practitioners.

SERIES IX—DONKEY.

General No.	Serial No.	Date of admission.	Names.	Age.	Sex.	Caste.	Duration.	Bubo.	Quantity injected.	Died.	Recovered.	Remarks.
17	1	1st April...	Foora Manjoo	...	M.	Hindoo	... 2 days	Left inguinal and iliac	130 c. c.	6-4-99	.....	Septic type, almost pulseless since admission, life prolonged over 4 days. Heart failure.
18	2	10th " ...	Nibalsingh Suhelsingh	10	M.	"	... 2 "	Right femoral	90 c. c.	...	Recovered.	

SERIES X—HORSE No. 3 (2nd Bleeding).

General No.	Serial No.	Date of admission.	Names.	Age.	Sex.	Caste.	Duration.	Bubo.	Quantity injected.	Died.	Recovered.	Remarks.
19	1	13th April	Morar Visram	...	M.	Hindu	... 3 days	Right femoral, inguinal, and iliac.	50 c. c.	14-4-99	.....	Sudden heart failure.
20	2	13th "	Michael DeSouza	...	M.	Christian	2 "	Right femoral, left pectoral, double cervical	170 c. c.	.....	Recovered ...	A most septic case, buboes appearing time after time, secondary pneumonia.
21	3	14th "	Ganesh Mawji	...	M.	Hindu	3 "	Right inguinal	100 c. c.	.....	Recovered.	Sudden heart failure.
22	4	14th "	Tripaya Kumpaya	...	M.	Do.	3 "	Right inguinal	105 c. c.	.....	Recovered.	Plague and influenza.
23	5	15th "	Luxumon Hariba	...	M.	Do.	3 "	Right inguinal and femoral	50 c. c.	17-4-99	.....	
24	6	14th "	* Ahmed	...	M.	Mussalman	1 "	Nil	40 c. c.	.....	Recovered ...	
25	7	17th "	Yessoo Hariba	...	M.	Hindu	2 "	Left femoral	35 c. c.	.....	Recovered.	
26	8	17th "	Raoo Rama	...	M.	Do.	3 "	Left femoral and iliac	80 c. c.	.....	Recovered.	
27	9	18th "	Mahadoo Poona	...	M.	Do.	2 "	Right femoral	106 c. c.	.....	Recovered.	Acute edema of lung and heart failure.
28	10	16th "	* Hira Laloo (Dr. D. S. F.)	25	M.	Do.	2 "	Right inguinal and femoral	60 c. c.	21-4-99	.....	Heart failure.
29	11	19th "	Succaram Ganoo	...	M.	Do.	2 "	Left femoral, inguinal and iliac	50 c. c.	20-4-99	.....	Acute edema of lung and heart failure.
30	12	19th "	Ganoo Khandoo	...	M.	Do.	2 "	Left femoral and inguinal	35 c. c.	20-4-99	.....	Do.
31	13	23rd "	Pandoo Mukund	...	M.	Do.	3 "	Right, femoral, inguinal and iliac.	40 c. c.	14-1-99	.....	Septic type. Acute edema of lung and heart failure.
32	14	23rd "	Balla Kushaba	...	M.	Do.	2 "	Left inguinal	95 c. c.	27-4-99	.....	

\* Cases treated by private Practitioners.



SERIES XI.--Horse No. 1 (2nd Bleeding).

Genl. Serial No.	Date of Admission.	Names.	Age Sex.	Caste.	Duration.	Bubo.	Quantity injected.	Died.	Recovered.	Remarks.
24th April	...	Bhana Khushal	22 M.	Hindoo...	2 days	Left inguinal	85 c. c.	.....	Recovered.	Heart failure; big, robust built; very acute case.
24th "	...	Rama Balloo	25 M.	Do. ...	2 "	Right femoral	60 c. c.	25-4-99	.....	
"	...	Ganoo Succaram	22 M.	Do. ...	3 "	Do.	70 c. c.	.....	Recovered.	
25th "	...	Sambhoo Gopal	12 M.	Do. ...	3 "	Right inguinal	115 c. c.	.....	Do.	Very acute; temperature 107° on second evening; edema of lungs.
16th "	...	* Mrs. F. Dubash	40 F.	Parsec ...	2 "	Left inguinal, iliac	130 c. c.	30-4-99	.....	Fatty degeneration of heart. Sudden heart failure.
27th "	...	Mahadoo Bhavoo	30 M.	Hindoo ...	2 "	Right inguinal	20 c. c.	27-4-99	.....	
29th "	...	Harapa Samboo	16 M.	Do. ...	2 "	Right iliac and left parotid	130 c. c.	.....	Recovered.	

\* Case treated by a private practitioner.

SERIES V--(continued). Horse No. 1.

Genl. Serial No.	Date of Admission.	Names.	Age Sex.	Caste.	Duration.	Bubo.	Quantity injected.	Died.	Recovered.	Remarks.
1	7	Samlia Dhondi	12 M.	Hindoo...	5 days	Right femoral	40 c. c.	.....	Recovered...	Probably a mixed case of plague and relapsing fever.
3	8	Kondibai, wife of Maruti...	20 F.	Do. ...	2 "	Do. and iliac	20 c. c.	5-3-99	.....	Died after one injection only; sudden heart failure.
3	9	Walji Tricum	10 M.	Do. ...	3 "	Left femoral and iliac	25 c. c.	7-3-99	.....	Died from sudden heart failure.
4	10	Tricum, Purnhottam	30 M.	Do. ...	3 "	Do.	50 c. c.	16-3-99	.....	Nourasius and exhaustion.
5	11	Hurgowan Tricum...	13 M.	Do. ...	3 "	Right axillary	45 c. c.	6-3-99	.....	Died from sudden heart failure.
6	12	Abba Bayajee	30 M.	Do. ...	2 "	Do. with inflammation.	130 c. c.	8-3-99	.....	Died from secondary pneumonia.
7	13	Bhagwan Bhana	25 M.	Do. ...	3 "	Left inguinal and femoral.	30 c. c.	.....	Recovered...	Good recovery without supuration of bubo.
8	14	Pandarath Balset	22 M.	Do. ...	2 "	Do. and iliac	25 c. c.	7-3-99	.....	Died from sudden heart failure.
9	15	Vasan Govind	30 M.	Do. ...	2 "	Right femoral and iliac	55 c. c.	9-3-99	.....	Died from secondary pneumonia.

## SERIES VI.—HORSE NO. IV.

Genl. No.	Serial No.	Date of Admission.	Names.	Age.	Sex.	Caste.	Duration.	Bubo.	Quantity Injected.	Died.	Recovered.	REMARKS.
10	1	4th March	Maneklal Lalla	36	Male	Hindoo	1 day	Left femoral	65 c. c. ...	5-3-99	.....	Sudden heart failure.
11	2	5th "	Rama Sakaram	14	"	Do.	1 "	Left femoral and inguinal...	20 c. c. ...	6-3-99	.....	Moribund.
12	3	7th "	Bindoo Bapu	32	"	Do.	3 "	Left axillary with infiltration.	18 c. c. ...	7-3-99	.....	Do.
13	4	7th "	Chandullash Farid...	46	"	Mussal...	4 "	Left parotid and posterior cervical.	52 c. c. ...	13-3-99	.....	Improvement and then relapse.
14	5	8th "	Ganoo Gaboor	20	"	Hindoo	3 "	Left femoral	40 c. c. ...	9-3-99	.....	Sudden heart failure.
15	6	7th "	Gafoor Lalla	7	"	Mussal...	2 "	Left inguinal	44 c. c. ...	10-3-99	.....	Plague and measles, heart failure.
16	7	7th "	Baikoo Ranchanfra	20	"	Hindoo	1 "	Left femoral	35 c. c. ...	9-3-99	.....	Septic type.
17	8	6th "	Aboo Govinda	18	"	Do.	2 "	Double inguinal and right femoral.	50 c. c. ...	.....	Recovered...	
18	9	8th "	Harshankar Baldeo	45	"	Do.	3 "	Rt. femoral and inguinal ...	55 c. c. ...	.....	Do.	Sudden heart failure.
19	10	9th "	Nathia Bhao	23	"	Do.	3 "	Left femoral, inguinal and iliac.	21 c. c. ...	10-3-99	.....	Sudden heart failure.
20	11	9th "	T. V. Mungabum	30	"	Christian.	2 "	Rt. inguinal and femoral ...	70 c. c. ...	13-3-99	.....	Sudden heart failure. Septic type.
21	12	8th "	Mr. J. B. J. ...	11	"	Parsi	2 "	Left femoral, iliac and mesenteric with infiltration.	105 c. c. ...	.....	Recovered ..	Septic type.
22	13	11th "	Bipti Mehege	20	"	Hindoo	3 "	Rt. inguinal...	100 c. c. ...	.....	Do.	Septic type, good recovery without suppuration of bubo.
23	14	11th "	Dagdo Sadoo	30	"	Do.	3 "	Right axillary	85 c. c. ...	15-3-99	.....	Secondary pneumonia.
24	15	12th "	L. C. Sequeira	45	"	Christian.	3 "	Left iliac	70 c. c. ...	15-3-99	.....	Fatty heart; secondary pneumonia.
25	16	13th "	Pandoo Janoo	20	"	Hindoo	2 "	Right inguinal	95 c. c. ...	.....	Recovered...	Bronchitis acethritis; good recovery.
26	17	13th "	Kesoo Lalla	60	"	Do.	2 "	Right femoral and inguinal	80 c. c. ...	23-3-99	.....	Death from exhaustion after 11 days.
27	18	13th "	Bhawanishanker Harjivan	17	"	Do.	2 "	Right femoral and iliac	40 c. c. ...	.....	Recovered...	Complicated with dysentery lasting over 12 days.
28	19	13th "	Juna Bhana...	25	"	Do.	2 "	Left axillary, Rt. femoral and inguinal.	60 c. c. ...	15-3-99	Do.	Death from gradual heart failure.
29	20	13th "	Francis X. Fernandes	20	"	Christian	3 "	Left femoral	85 c. c. ...	.....	Recovered.	Secondary pneumonia.
30	21	13th "	Girwa Sadoo	35	"	Hindoo	4 "	Right femoral	75 c. c. ...	.....	Do.	Good recovery without suppuration of bubo.
31	22	14th "	Appa Bhaskar	20	"	Do.	2 "	Right inguinal	50 c. c. ...	.....	Do.	Good recovery without suppuration of bubo.
32	23	14th "	Shiva Kondaji	35	"	Do.	2 "	Left femoral	13 c. c. ...	.....	Do.	Good recovery without suppuration of bubo.
33	24	14th "	Ciprian Fernandez	25	"	Christian.	2 "	Left axillary	30 c. c. ...	.....	Do.	Good recovery without suppuration of bubo.
34	25	15th "	John De Costa	30	"	Do.	3 "	Left femoral and iliac	40 c. c. ...	15-3-99	.....	Moribund.
35	26	15th "	Sukia Jahari	30	"	Hindoo	4 "	Rt. axillary with infiltration	40 c. c. ...	16-3-99	.....	Secondary pneumonia; heart failure.

SERIES VI.—HORSE No. IV--*contd.*

Genl. No.	Serial. No.	Date of Admission.	Names.	Age.	Sex.	Caste.	Duration.	Pubo.	Quantity Injected.	Died.	Recovered.	REMARKS.
36	27	15th March	Deria Isra	23	Male	Hindoo	5 days	Left axillary	40 c. c.	.....	Recovered...	Good recovery without suppuration of bubo or any complications.
37	28	16th "	Mannajee Isram	15	"	Do.	3 "	Right axillary	40 c. c.	17-3-99	.....	Sudden heart failure
38	29	15th "	Cyprian Alhousa	40	"	Christian.	1 "	Rt. femoral	80 c. c.	18-3-99	.....	Heart failure.
39	30	15th "	Mrs. H. S.	56	F.	Parsee	4 "	Double inguinal and left femoral.	57 c. c.	22-3-99	.....	Death from heart failure, edema of lung.
40	31	16th "	Bhugwandass Raghoodass	30	Male	Hindoo	4 "	Left inguinal and femoral.	50 c. c.	.....	Recovered.	
41	33	16th "	Domingo Caitan	60	"	Christian.	1 "	Left femoral	55 c. c.	18-3-99	.....	Acute edema of lung and heart failure.
42	33	17th "	Krishna Vithoo	40	"	Hindoo	3 "	Rt. femoral and inguinal	70 c. c.	19-3-99	.....	Heart failure.
43	34	17th "	Cosnee D. Desa	23	"	Christian.	3 "	Right axillary	105 c. c.	19-3-99	.....	Sudden heart failure.
44	35	17th "	Wallabh Prema	28	"	Hindoo	4 "	Right inguinal	55 c. c.	20-3-99	.....	Edema of lung.
45	36	16th "	Sanduram Karamchand	30	"	Do.	4 "	Right femoral	65 c. c.	20-3-99	.....	Septic type.
46	37	17th "	Mrs. Mossee	30	F.	Christian.	4 "	Left femoral	60 c. c.	.....	Recovered.	Death from secondary pneumonia.
47	38	17th "	Babaji Tora	40	Male	Hindoo	3 "	Left femoral	60 c. c.	26-3-99	.....	Sudden heart failure.
48	39	18th "	Peter Fernandes	30	"	Christian.	2 "	Rt. femoral and bruises on leg.	40 c. c.	14-3-99	.....	
49	40	18th "	Maruti Ganoo	20	F.	Hindoo	3 "	Rt. femoral and iliac	70 c. c.	.....	Recovered...	Extremely weak and delicate patient; failure of heart; temperature rose to 106° within 18 hours of onset of symptoms and heart commenced to fail.
50	41	17th "	Miss B. J. S.	16	"	Parsi	2 "	Left femoral and inguinal	50 c. c.	14-3-99	.....	Bronchitis.
51	42	18th "	Savatri, wife of Sanala	35	"	Hindoo	2 "	Rt. inguinal	55 c. c.	20-3-99	.....	
52	43	18th "	Francis Pereira	30	Male	Christian	1 "	Right inguinal	45 c. c.	.....	Recovered.	Sudden heart failure.
53	44	18th "	A. S. Lobo	60	"	Do.	3 "	Left femoral and inguinal	85 c. c.	19-3-99	.....	
54	45	18th "	Sheik Madar	30	"	Musal.	3 "	Rt. femoral and inguinal	30 c. c.	19-3-99	.....	Sudden heart failure.
55	46	18th "	P. S. DeCosta	42	"	Christian.	1 "	Right femoral	75 c. c.	22-3-99	.....	Secondary pneumonia.



SERIES VII.—Horse No. VI.

Genl. No.	Serial No.	Date of Admission.	Names.	Age.	Sex.	Caste.	Duration.	Bubo.	Quantity Injected.	Died.	Recovered.	REMARKS.
56	1	16th March	Piran Ameer	35	M.	Mus sul-man.	2 days	Left axillary	105 c. c.	.....	Recovered...	Had secondary pneumonia but made a good recovery.
57	2	18th "	Sawla Mahadco	35	"	Hindoo	1 "	Left inguinal	50 c. c.	20-3-99	.....	Moribund; gradual heart failure.
58	3	19th "	Dhondoo Krishna	30	"	Do.	3 "	Left axillary	55 c. c.	.....	Recovered.	Death from pressure upon the vital structures of the neck.
59	4	20th "	Sita Baloo	22	"	Do.	3 "	Right posterior, cervical and parotid infiltration right neck.	100 c. c.	24-3-99	.....	
60	5	21st "	Michael Francis	14	"	Christian..	2 "	Left inguinal and iliac	85 c. c.	24-3-99	.....	Heart failure.
61	6	22nd "	Soma Prena...	12	"	Hindoo	5 "	Left cervical	87 c. c.	20-3-99	.....	Secondary pneumonitis; heart failure.
62	7	23rd "	Nana Raoji	25	"	Do.	1 "	Right femoral	40 c. c.	24-3-99	.....	Sudden heart failure.
63	8	24th "	Bhagla Ponibia	18	"	Do.	3 "	Right femoral	105 c. c.	28-3-99	.....	Heart failure.
64	9	25th "	Mahadco Punja	25	"	Do.	2 "	Right axillary	85 c. c.	30-3-99	.....	Secondary pneumonia.
65	10	25th "	Bhugwanprasad Hanuman	18	"	Do.	2 "	Double femoral	120 c. c.	.....	Recovered...	Good recovery without suppuration of bubo.
66	11	25th "	Tatya Bayajee	25	"	Do.	1 "	Right inguinal	40 c. c.	27-3-99	.....	Secondary pneumonia.
67	12	26th "	Ratan Dhunna	14	"	Do.	2 "	Right femoral	77 c. c.	.....	Recovered...	Good recovery.
68	13	27th "	Babajec Dhakoo	30	"	Do.	3 "	Right inguinal	115 c. c.	.....	Recovered.	

SERIES VIII.—Horse No. V. (2nd Bleeding).

Genl. No.	Serial No.	Date of Admission.	Names.	Age.	Sex.	Caste.	Duration.	Bubo.	Quantity Injected.	Died.	Recovered.	REMARKS.
69	1	28th March	Balla Mahadco	25	M.	Hindoo	2 days	Left femoral and inguinal.	60 c. c....	30-3-99	.....	Sudden heart failure.
70	2	28th "	Rama Hari	30	"	Do.	4 "	Right femoral and inguinal.	100 c. c....	1-4-99	.....	Edema of lung.
71	3	29th "	Vittooo Ratoo	18	"	Do.	1 "	Left femoral	97 c. c....	.....	Recovered...	Good recovery.
72	4	30th "	Chand Meera	25	"	Mus sul-man.	2 "	Left femoral and inguinal.	135 c. c....	4-4-99	.....	Septic type; life prolonged for 5 days; death from edema of lung.
73	5	30th "	Gunoo Jotie	35	"	Hindoo	1 "	Left femoral, right cervical.	40 c. c....	31-3-99	.....	Acute edema of lungs; heart failure.
74	6	31st "	J. F. De Mello	29	"	Christian.	2 "	Left femoral	120 c. c....	.....	Recovered...	Good recovery; uncomplicated.

No. 614 OF 1899.

BOMBAY, 8th June 1899.

To

THE MUNICIPAL COMMISSIONER,  
THROUGH THE SPECIAL MEDICAL OFFICER,  
AND THE EX. HEALTH OFFICER.

Sir,—I have the honour to forward herewith a report and return of the cases treated with Professor Lustig's serum in May 1899.

2. The total number of cases treated was 17, of whom 9 died and 8 recovered, giving a mortality rate of 52·94 per cent. as against 69·23 per cent. amongst those not similarly treated. The results show a difference of 16·29 per cent. in favour of the cases treated with the serum.

3. The cases were divided in the following series :—

Series.	Horse No.	Bleeding.	No.	Died.	Recovered.
XI.* ...	1	Second... ..	15	8	7
XII.† ...	4	Do. ... ..	2	1	1
		Total ...	17	9	8

\* Completed.

† To be continued.

I have, &amp;c.,

N. H. CHOKSY,

Medical Officer in charge, Arthur Road Hospital.

SERIES XII.—Horse No. 4 (2nd Bleeding.)

Genl. No.	Serial No.	Date of admission.	Names	Age.	Sex.	Caste.	Duration.	Bubo.	Quantity injected.	Died.	Recovered.	REMARKS.
16	1	21st May	* Mr. C. F. D.	43	M.	Parsi	4 days	Right inguinal	105 c. c.	.....	Recovered.	Plague and malaria.
17	2	24th "	* Mr. Khuragett	53	M.	"	3 "	Right axillary with extensive infiltration on chest and shoulders.	135 c. c.	27-5-99	.....	Choluria; fatty heart, heart failure, gradual.

• Cases treated by private practitioners.

SERIES XI.—Horse No. I. (2nd Bleeding)—(Completed).

Genl. No.	Serial No.	Date of admission.	Names.	Age.	Sex.	Caste.	Duration.	Bubo.	Quantity injected.	Died.	Recovered.	REMARKS.
1	8	1st May	Matarba Ittoo	35	M.	Hindoo	4 days.	Left femoral	60 c. c.	.....	Recovered.	Death from edema of lung.
2	9	2nd "	Chandri, wife of Anjia	28	F.	Do.	5 "	Right axillary	110 c. c.	6-5-99	.....	Do.
3	10	2nd "	Dhondoo Anjia	6	M.	Do.	5 "	Over left lower ribs	30 c. c.	.....	Recovered.	Do.
4	11	2nd "	Laxmi Hari...	28	F.	Do.	4 "	Right inguinal	50 c. c.	.....	.....	Do.
5	12	4th "	Krishna Dhondi	35	F.	Do.	3 "	Right femoral and inguinal.	85 c. c.	6-5-99	.....	Sudden heart failure.
6	13	6th "	Shivdatdass Sadoo	35	M.	Do.	2 "	Right inguinal	70 c. c.	7-5-99	.....	Do. from diarrhoea.
7	14	7th "	Bhiva Dada	35	M.	Do.	2 "	Left femoral	60 c. c.	8-5-99	.....	Acute edema of lung, diarrhoea, heart failure.
8	15	8th "	Kavel Sama	20	M.	Do.	8 "	Right axillary with infiltration.	55 c. c.	.....	Recovered.	Suppuration of infiltration.
9	16	10th "	Anusaya Dhodiba	6	F.	Do.	5 "	Left inguinal	20 c. c.	.....	Do.	Death from edema of lung.
10	17	13th "	Valab Nagar	30	M.	Do.	5 "	Right axillary	35 c. c.	18-5-99	.....	Do.
11	18	15th "	Chandrabai Ballu	30	F.	Do.	2 "	Right posterior cervical	60 c. c.	.....	Recovered.	Pneumonic plague; death from heart failure.
12	19	23rd "	Kalidin Bindhu	30	M.	Do.	4 "	Left Femoral	40 c. c.	24-5-99	.....	Heart failure, very delirious on admission with failing pulses.
13	20	26th "	Anandi Bhawani	22	F.	Do.	3 "	Right inguinal	55 c. c.	28-5-99	.....	Pregnant, aborted next morning; admitted with edema of lung; death from heart failure.
14	21	27th "	Jayee Kama	30	F.	Do.	2 "	Right axillary and supra-trochlear.	80 c. c.	28-5-99	.....	Do.
15	22	30th "	Mulla Kanna	14	M.	Do.	4 "	Right femoral	35 c. c.	.....	Recovered.	Do.



16. In accordance with a wish expressed by me that Dr. Choksy would undertake to try Lustig's serum treatment on every alternate case admitted into the Arthur Road Hospital, he very kindly undertook to carry this plan out, and his letter No. 625 is herewith appended. The experiments being not yet completed, it is impossible to give any definite opinion on this subject.

No. 625 OF 1899.

ARTHUR ROAD HOSPITAL,

BOMBAY, 12th June 1899.

TO THE MUNICIPAL COMMISSIONER,

SIR,—I have the honour to submit the following report on the observations conducted by treating every alternate case of plague with Professor Lustig's serum :—

1. Although I had fully expressed my views on the method of investigating the serum treatment by treating every alternate case in my report for April last, still in deference to the wishes of Lieutenant-Colonel J. S. Wilkins, D.S.O., I.M.S., the Special Medical Officer, a series of observations was conducted last month. And the results are just as I had anticipated, fully bearing out and confirming the conclusions I had arrived at in the report above mentioned as to the best way of conducting similar investigations. However attractive and plausibly fair the method of the treatment of every alternate case may appear on the surface, when tested with rigid scientific accuracy it falls to the ground and exposes the fallacies incidental to it, even in a small series of 46 cases as the present.

2. In this series observations were conducted on 46 plague patients, and every alternate case was treated with the serum, irrespective of the type of the disease, the state of the patient, the duration of illness, the position of buboes, and irrespective also of age, sex and caste, etc., etc., conditions which are absolutely necessary for proper control cases, and which even Professor Wright of the Indian Plague Commission had to admit to be the most reliable and the least open to error. Under these circumstances the serum had to be wasted in 7 moribund cases and also in one convalescent case that did not actually require it, and had to be injected with a small quantity in order to fulfil the conditions of the experiment.

3. The results of these observations are no less interesting than instructive, and illustrate in a way the errors that tend to vitiate the results of all such observations. Of the 23 cases treated with the serum, 15 died and 8 recovered; in the 23 alternate cases not so treated, the results were the same. But the conditions in these two series were not identical; for whereas the series of cases, not treated with the serum, had the advantage in their favour of 4 convalescent cases, there was only one such convalescent case included amongst the serum cases; moreover, the latter had 7 moribund cases to 6 in the former. And as all the moribund cases died, and all the convalescent cases recovered in both the series, the serum series had one convalescent case only in its favour, and one more moribund against it, as contrasted with the non-serum series that had 4 convalescents and one less moribund, and proportionately, therefore, the results in the latter series preponderated in its favour to the above extent:—

No.			Serum cases.	Non-serum cases.
			23	23
Convalescent	...	...	1	4
Moribund...	...	...	7	6
Total ...			15	13

The above statement shows that for actual basis of comparison, only the 15 serum cases could be compared with the 13 non-serum cases. Of the former 8 died and 7 recovered and of the latter 9 died and 4 recovered.

4. It thus appears that in one and the same series of cases results differ considerably and are influenced for better or worse in proportion to the number of convalescent and moribund cases that happen to be admitted under the one or the other head, and are therefore inconclusive for or against the serum, inasmuch as it is impossible to so control the admissions that convalescent and moribund cases should fall in in equal proportions in each series.

		Mortality rate of serum cases.	Mortality rate of non-serum cases.
(a) All cases	...	65.21	65.21
(b) Excluding convalescents	...	68.18	78.94
(c) Excluding convalescent and moribund	...	53.33	69.23

The above statement shows conclusively the variations in the results, and the only reliable figures are those in Section (c), as all errors consequent on moribund and convalescent cases are excluded from it; and the results would appear still more favourable were the errors incidental to the other conditions named in para. 2 also eliminated.

Even if the results had been no better than they are, they would not have been less in favour of the serum treatment and *vice versa* if so. On the whole the mortality rate of 65.21 per cent. in all the 46 cases is less than the average rate, and bears the impress of the influence exerted by the serum, even under the above-mentioned unfavourable conditions of experiment.

I have, &c.,

N. H. CHOKSY.

Medical Officer in charge Arthur Road Hospital.

No. 626 of 1899.

Return showing the results of private cases treated with the serum during February, March, April and May, 1899:—

Month.	No.	Died.	Recovered.
February ... ..	8	2	6
March ... ..	3	2	1
April ... ..	9	4	5
May ... ..	2	1	1
Total.....	22	9	13

Mortality rate 40.90 per cent.

N. H. CHOKSY,

Medical Officer in charge Arthur Road Hospital.

No. 627 OF 1899.

Return showing the number of Admissions from plague in the Arthur Road Hospital and the number treated with the serum during February, March, April and May 1899 :—

Month.	Admissions.	No. treated with serum.	Remarks.
February ... ..	324	60	} Quantity of serum prepared just suffi- cient for the number of patients treated.
March ... ..	383	71	
April ... ..	161	30	
May ... ..	55*	23	
Total ...	923	184	

\* 23 cases treated with serum.

23 cases for "control" observations of every alternate case.

9 cases died before being seen by the Medical Officers.

N. H. CHOKSY,

Medical Officer in charge Arthur Road Hospital.

June 25th, 1899.

TO THE DEPUTY COMMISSIONER, PLAGUE OPERATIONS.

SIR,—With reference to Dr. Choksy's report on the cases treated with Professor Lustig's serum in May 1899, I have the honour to point out that the arguments brought forward are perfectly valid, when it is possible only to experiment with a small number of cases; when there are only a few cases to be divided into the two groups—

1. Control cases.
2. Cases treated with the serum.

One or other of these groups will probably contain a large proportion of the convalescent or moribund cases, and in this way the statistics may give a wrong impression of the effect of the serum treatment.

On the other hand if only picked cases are treated with the serum, the results will be always open to criticism.

The only method the results of which will be above criticism is to treat every alternate case of plague admitted into the hospital, while keeping the remaining cases as control.

Where this method has been adopted with a large number of cases (for instance 150 or more of both groups), the convalescent and moribund cases will be found to have been very equally divided, and a true and scientific opinion can be formed as to the value of the remedy. This has been well instanced in the case of diphtheria antitoxin. In some hospitals, where only picked cases were treated, the percentage of recoveries was very large, giving a very false impression of the real value of the treatment.

In one large fever hospital most careful statistics were kept of the results of inoculating every alternate case. Nearly 1,000 cases were compared in this way, and it was found in the end that the moribund and very mild



cases in the two groups were almost exactly equal in number, and as a result an accurate estimate of the value of the treatment was formed. The results obtained at this hospital have formed the standard figures giving the true effect of the anti-toxin treatment of diphtheria and have never been criticized or controverted.

The same absolutely fair test ought to be applied to the treatment of plague with Professor Lustig's serum. When a considerable number of cases have been treated on these lines, the sources of error, quoted by Dr. Choksy, will be found to have been eliminated, and the comparison of the results in the two groups of cases will establish or otherwise once for all the value of serum treatment of plague.

I have, &c.,  
C. H. CAYLEY,  
Ag. Special Medical Officer.

Submitted to Commissioner.

J. H. DuBOULAY.

23rd June 1899.

Instructions accordingly should issue to Dr. Choksy.

W. L. HARVEY.

25th June 1899.

This, then, is, as far as we have gone, a history of the manufacture and use of Lustig's serum as prepared in Bombay and will be found very interesting. I am personally of opinion that the manufacture of this serum should be continued as long as the results given are hopeful, which they decidedly are ; or until some other and more potent remedy is found to act on this most fatal disease. Dr. Cayley's remarks are very much to the point, and should the epidemic again come on us we will, I trust, be able to give the serum a fair trial.

